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(54) Title: METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE TERMINAL		
(57) Abstract		
<p>A POS terminal determines an upsell to offer in exchange for the change due to a customer in connection with a purchase. The point-of-sale terminal preferably maintains a database of at least one upsell price and a corresponding upsell to offer a customer in exchange for the change due to him. If the customer accepts the upsell, the cashier so indicates by pressing a selection button on the POS terminal. The required payment amount for the customer to pay is then set equal to the rounded price, rather than the purchase price. Thus, the customer receives the upsell in exchange for the coins due to him, and the coins need not be exchanged between the customer and the POS terminal.</p>		

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METHOD AND SYSTEM FOR PROCESSING  
SUPPLEMENTARY PRODUCT SALES  
AT A POINT OF SALE TERMINAL

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FIELD OF THE INVENTION

The present invention relates to point-of-sale terminals, and, more specifically, to methods and systems for processing product sales at point-of-sale terminals.

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BACKGROUND OF THE INVENTION

This invention relates to a lottery ticket transaction system. More particularly, the 15 present invention relates to a system and a method for selling lottery tickets using point-of-sale ("POS") terminals that generate sales receipts containing both merchandise sales information and lottery ticket information.

Many states in the United States, as well as some foreign countries, have 20 government-conducted lottery systems. Government-conducted lotteries offer the public a desirable product (usually the chance to win a large cash prize), and have the benefit of increasing governmental revenues without burdening the public with additional or increased taxes. In many instances, the revenue generated from a governmental lottery is dedicated to a particular purpose or goal, such as improving the education system or reducing property taxes.

In a typical government-conducted lottery system, a central lottery computer is used 25 to communicate with dedicated lottery terminals. A player selects numbers on a lottery playslip, and the lottery terminal operator inserts the lottery playslip into a reader at the

lottery terminal, which optically reads the lottery playslip using a known mark-sense process. The dedicated lottery terminal then communicates the player's selected numbers to a central lottery computer which in turn stores them. After the lottery numbers have been stored, the dedicated lottery terminal, under the control of the central lottery computer,

5 prints and issues the lottery ticket.

One popular lottery game, known as "lotto," typically requires the player to choose six numbers from one to forty-two. The selected group of numbers are then compared to the winning lottery numbers, which have been randomly selected from the larger pool of numbers, from one to forty-two, at some specified time and date after purchase of the lotto

10 ticket, usually once or twice each week. To win a prize, the lotto ticket numbers must be equal to all or some of the winning lottery numbers.

While players may select their own lottery numbers, most lotto games provide the option of having the central lottery computer system select random "quick-pick" lottery numbers instead. This saves the purchaser the time and inconvenience of picking his or her

15 own numbers. These automatic lottery number generation systems are usually known as "quick-pick" systems.

A variety of games may be played in a typical lottery. In conventional lottery games, a player purchases a lottery ticket. Inscribed on that lottery ticket are one or more lottery numbers and a serial number. The serial number functions as a simple method of fraud

20 prevention, because it uniquely identifies each lottery ticket sold. The lottery number also allows both the player and the lottery system to identify a winner; specifically, the lottery numbers are compared by the player to a "winning number list", to determine if the player has won a prize.

There are also instant lottery games in which the outcome is determined prior to the sale of the lottery ticket. By uncovering concealed indicia inscribed on the lottery ticket, the player can determine if the lottery ticket is a winner - immediately after purchase.

Some foreign countries (e.g. Germany) allow a lottery player to purchase fractional

- 5 lottery tickets. However, these lottery systems only allow the player to purchase fixed fractions of certain high-priced lottery tickets (e.g., a half, or quarter share of a lottery ticket). In these instances, if the lottery ticket is a winner, the purchaser will only receive one-half or one-quarter of the full prize amount.

The majority of lottery tickets are sold by grocery, liquor and convenience stores.

- 10 These retail stores typically place the dedicated lottery terminal away from one or more POS terminals used for merchandise transactions. This physical separation is to ensure that the merchandise transaction line is not slowed-down or blocked by customers wishing to make lottery ticket purchases. In addition, since the lottery terminals have a separate and distinct accounting system, there is no need to co-locate the POS terminals and dedicated lottery
- 15 terminals.

However, some customers may consider it annoying to make two separate

transactions, i.e., merchandise and lottery tickets, on two different terminals within the same store. Separate terminals may also force the customers to wait in two separate lines, or may slow down the overall merchandise check-out procedure while a single store clerk performs

- 20 two separate transactions on two terminals. Besides annoying the merchandise-only customers, these inconveniences also reduce the impulse purchasing of lottery tickets, which in turn leads to loss of revenue for the government and the store.

There are other disadvantages with using two separate and distinct terminals for merchandise transactions and lottery ticket transactions. The government usually bears the

- costs of purchasing, leasing, installing and maintaining the dedicated lottery terminals. There are also the considerable costs of resupplying the lottery ticket paper and ink for each dedicated lottery terminal. Moreover, many retail stores with multiple checkout lines and registers, such as supermarkets, do not have the resources to support dedicated lottery
- 5 terminals at every check-out register. In addition, a dedicated lottery terminal uses counter space that could otherwise be devoted to revenue-producing merchandise displays. It is also costly to train store personnel in the operation of two distinct types of transaction terminals. These factors reduce the availability of lottery tickets to consumers, and thus reduce governmental revenue, by limiting the number of locations that sell lottery tickets.
- 10 After many years of steadily increasing profits, many state-run lotteries have seen a downturn in profits. Improving the ease of purchasing lottery tickets and increasing their availability has become a primary concern as many states are modernizing their lottery systems. The current lottery system does not allow for the sale of fractional value lottery tickets at retail point of sale terminals. There is a significant loss of revenue from this lost opportunity to buy fractional value lottery tickets. Accordingly, there is a need for a system
- 15 that solves the above described problems.

- Most stores that are visited by customers have one or more point-of-sale ("POS") terminals, such as cash registers. Store cashiers use POS terminals for calculating the total price of a purchase (one or more products) and the amount of change due to a customer.
- 20 Some POS terminals furthermore track purchases made and adjust a database of store inventory accordingly.

The amount of change due is the difference between the purchase price and the amount tendered by the customer. Customers typically tender whole number cash amounts in the form of bills of paper money, while purchase prices are most often non-whole number

amounts. Accordingly, the amount of change due to a customer at a POS terminal typically includes one or more coins, which the POS terminal or cashier dispenses to the customer.

Receiving and carrying change, especially coins, is an annoyance to many customers. Consequently, customers often are forced to tender non-whole number cash amounts in order to dispose of their unwanted coins and/or reduce the coins that would otherwise be given to them as change for their purchase. Coins and bills that are tendered by the customer are collected by the cashier at the POS terminal.

Both dispensing coins to and collecting coins from a customer increases the amount of time a cashier spends processing a purchase, and therefore increases the amount of time that customers wait in line at a POS terminal. Accordingly, businesses must pay wages for time spent handling coins, and customers must experience delays as coins are exchanged between cashiers and customers.

In addition, it is possible that the cashier will make a mathematical error and dispense the wrong amount of change. Customers often anticipate such an error and count their change to assure that they received the correct amount. Such customers typically count their change before leaving the POS terminal, further delaying other customers.

Businesses incur costs associated with counting, rolling, banking and otherwise handling coins. By some estimates, businesses expend hundreds of thousands of hours and hundreds of millions of dollars each year just to handle coins.

In summary, the exchange of change, especially coins, between customers and POS terminals is costly, time-consuming and undesirable. Unfortunately, conventional POS terminals merely calculate purchase prices and amounts of change due, and cannot reduce the amount of change due nor the exchange of coins.

Accordingly, it would be advantageous to provide a system and method that reduced the amount of change due, and therefore reduced the coins exchanged between customers and cashiers at a POS terminal.

Lotteries are extremely popular games that generate significant revenues for

- 5 sponsoring states that offer such games. In a typical lottery, a player (ticket holder) purchases a lottery ticket having ticket numbers and a serial number inscribed thereon. The ticket numbers allow both the ticket holder and a lottery agent to identify whether the ticket holder has won a prize. The serial number uniquely identifies the lottery ticket, and is typically recorded by a lottery agency so that the lottery ticket may be validated. For
- 10 example, the serial number may be used to verify whether the ticket numbers inscribed on a ticket match those ticket numbers that the lottery agency has recorded as associated with that lottery ticket.

A typical lottery ticket has six ticket numbers, each selected from a range, such as the range of from one to forty-nine. The six ticket numbers may have been selected by the ticket holder or, at the request of the ticket holder, randomly selected by the lottery terminal printing the ticket. On a drawing date, the lottery agency randomly selects six ticket numbers, which are deemed "winning" ticket numbers. A lottery ticket having ticket numbers that match some or all of the winning ticket numbers is a winning ticket, and the corresponding holder of the lottery ticket wins a prize.

- 20 The grandparent application of the present application, Patent Application No. 08/822,709, entitled SYSTEM AND METHOD FOR PERFORMING LOTTERY TICKET TRANSACTIONS UTILIZING POINT-OF-SALE TERMINALS, filed on March 21, 1997, discloses a system and method by which fractional lottery tickets may be sold to a customer at a point-of-sale ("POS") terminal in exchange for change due. For example, a customer

may bring a purchase to a POS terminal, and the POS terminal may calculate the purchase price to be \$4.74. If the purchase price is rounded to the nearest \$1, the change due is \$5.00 - \$4.74 = \$0.26. Accordingly, the customer may be sold a 26% share of a \$1 lottery ticket in lieu of the change due. If the lottery ticket wins, 26% of the corresponding prize is awarded 5 to the customer.

There are numerous advantages to providing a fractional lottery ticket in exchange for change due. As described in the parent application of the present application, Patent Application No. 08/920,116, entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE TERMINAL, filed on 10 August 26, 1997, dispensing and collecting coins is costly and burdensome. Furthermore, many customers consider coins to be dirty, and would prefer not to handle them. Thus, many customers will find the exchange of change due for a fractional lottery ticket to be very desirable.

Unfortunately, some state lottery agencies may be reluctant to change their practices 15 by issuing lottery tickets for fractional amounts. Such state lottery agencies may instead prefer to offer tickets in only a few predetermined, rounded amounts, such as tickets for \$1, \$2 and \$5 only. In some circumstances, the ability to offer fractional lottery tickets may require substantial modifications to the hardware and software of lottery terminals used throughout one or more states. Although such changes may ultimately be profitable, the 20 initial cost may be perceived to be unduly burdensome, and the eventual profit to be made may appear too speculative. In summary, the issuance of fractional lottery tickets by state lottery agencies may not be practical in all circumstances.

Accordingly, it would be advantageous to facilitate the purchase of fractional lottery tickets without requiring significant changes in existing lottery systems.

- Point-of-sale ("POS") terminals, such as cash registers, are used in a wide variety of businesses for performing such processes as calculating the total price of a purchase (good or service) and calculating the amount of change due to a customer. Depending on their level of sophistication, such POS terminals may be further useful in performing related
- 5 functions such as inventory management by tracking purchases made and adjusting a database of store inventory accordingly. In addition, POS terminals may be used with and/or function as an offering system.

The parent application of the present application, Patent Application No. 08/920,116,

entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT

- 10 SALES AT A POINT-OF-SALE TERMINAL, filed on August 26, 1997, discloses a system in which a customer at a POS terminal is offered an "upsell" in exchange for an amount of change he is due. An upsell, as defined therein and used herein, means a product (good or service) which is offered along with a purchase. Types of upsells include (i) an upgrade from a first product to a second product different from the first product, (ii) an additional product, (iii) a voucher which is redeemable for a product or a discount thereon, and (iv) an entry in a sweepstakes, contest, lottery or other game. For example, a customer purchasing a first product for \$1.74 may be offered a second product in exchange for \$0.26 (the change due if the customer tenders \$2.00). Various other types of upsells may be used without departing from the scope and spirit of the present invention.

- 20 As also disclosed in the aforementioned parent application, many different criteria may be used in determining an upsell. For example, a POS terminal may calculate the purchase price, and round the purchase price to the nearest dollar to generate a round-up (change) amount. The POS terminal in turn determines which of a plurality of upsells may be profitably exchanged for the round-up amount.

It would be advantageous to provide other methods of determining upsells. It would be particularly advantageous to provide a method and apparatus for determining an upsell which personnel, such as a store manager or POS terminal operator, may easily understand and adjust.

5 Point-of-sale ("POS") terminals, such as cash registers, are used in a wide variety of businesses for performing such processes as calculating the total price of a purchase (goods or services) and calculating the amount of change due to a customer. Some POS terminals furthermore track items sold and adjust a database of store inventory accordingly.

A POS terminal may perform a supplementary process in addition to performing the  
10 processes listed above. A supplementary process can increase sales, and thereby increase the average profit gained per transaction. One such supplementary process is described in a parent application of the present application, Patent Application No. 08/920,116, entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE TERMINAL, filed on August 26, 1997. Described therein is a  
15 supplementary process in which a customer at a POS terminal is offered an "upsell" in exchange for an amount of change due. The POS terminal determines an upsell in dependence on a purchase of the customer, and also determines an upsell price (the amount of change due) based on the purchase. For example, a customer purchasing a first product for \$1.74 and tendering \$2.00 may be offered a second product in lieu of the \$0.26 change  
20 due. The upsell price, \$0.26, thus depends on the purchase price \$1.74.

Another supplementary process is a computer-determined "suggestive sell". U.S. Patent No. 5,353,219 describes a system for suggesting items for a customer to purchase from a primary category at conventional item prices. Still another supplementary process is described in a parent application of the present application, Patent Application No.

08/841,791, entitled METHOD AND APPARATUS FOR SELLING SUBSCRIPTIONS TO PERIODICALS IN A RETAIL ENVIRONMENT, filed on May 5, 1997. Described therein is a supplementary process in which a customer purchasing an issue of a periodical at a POS terminal is offered the opportunity at that time to purchase a subscription to that 5 periodical.

Such supplementary processes may be performed solely within the POS terminal itself. For example, a cash register may be programmed to calculate an amount of change due, and determine an upsell to offer in exchange for the change due. Alternatively, the supplementary process may be performed with the assistance of a device in communication 10 with the cash register. For example, a remote server computer connected to the cash register via a communications network may determine an upsell to offer in exchange for the change due.

A supplementary process performed at a POS terminal may undesirably slow the rate at which customer transactions are completed. For example, it may take several seconds for 15 a cashier operating a POS terminal to offer a customer an upsell in exchange for an amount of change due, and for the customer to decide whether to accept such an offer. Offering a customer a choice of several upsells in exchange for an amount of change due could impose yet further delays on completing customer transactions.

Such delays may be acceptable under some conditions, yet unduly burdensome under 20 other conditions. For example, during lunch or other times of day, there may be a long line at a POS terminal. It would be inadvisable to add to the wait of each customer in line by performing a supplementary process as well. However, eliminating the supplementary processes may speed the completion of customer transactions, but at the cost of the extra

profit derived from such supplementary processes. Accordingly, a need exists for controlling the performance of supplementary processes at POS terminals.

Point-of-sale ("POS") terminals, such as cash registers, are used in a wide variety of businesses for performing such processes as calculating the total price of a purchase (goods or services) and calculating the amount of change due to a customer. Some POS terminals furthermore track purchases made and adjust a database of store inventory accordingly. As described in the parent application of the present application, Patent Application No. 08/920,116, entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE TERMINAL, filed on August 26, 1997, a customer at a POS terminal is offered an "upsell" in exchange for an amount of change due. The POS terminal determines an upsell in dependence on a purchase of the customer, and also determines an "upsell price" (the amount of change due) based on the purchase. For example, a customer purchasing a first product for \$1.74 and tendering \$2.00 may be offered a second product, perhaps at an attractively discounted price, in lieu of the \$0.26 change due. The upsell price, \$0.26, thus depends on the purchase price \$1.74; the upsell price is not fixed like most conventional prices for items.

As described in the aforementioned parent application, offering upsells in exchange for change due has significant advantages. For example, customers are typically adverse to handling change, and would welcome the opportunity to dispense with it. In addition, the customer derives satisfaction from a sale at an attractively-low price.

Typically, a business may have several different upsells that may be offered. In fact, for any particular purchase, it may be possible to offer several different upsells. The particular upsell that is actually offered to a particular customer may depend on a number of criteria associated with the purchase, such as the change amount, the time of day and the

items purchased. Since there may be so many possible upsells to offer any particular customer, it may be difficult or impossible to determine which upsell that customer is likely to accept.

In addition to the difficulty of selecting an upsell to offer, offering an upsell may in

- 5 some circumstances require time. However, there is no guarantee that the time spent offering an upsell will prompt the customer to accept the upsell and, consequently, provide revenue to the offeror. Thus, many offered upsells will be unaccepted, thus resulting in a waste of time and effort. Accordingly, it would be advantageous to eliminate the uncertainty that is inherent in offering upsells.

- 10 Point-of-sale ("POS") terminals, such as cash registers, are used in a wide variety of businesses for performing such processes as calculating the total price of a purchase (goods or services) and calculating the amount of change due to a customer. In addition, POS terminals may also be used with an offering system in order to provide offers to customers. Such offering systems may be intended to increase sales, and thereby increase the average  
15 profit gained per transaction.

One type of offering system is described in the parent application of the present application, Patent Application No. 08/920,116, entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE

- TERMINAL, filed on August 26, 1997. As described therein, a customer at a POS terminal  
20 is offered an "upsell" in exchange for an amount of change he is due. The POS terminal determines an upsell in dependence on a purchase of the customer, and also determines an upsell price (the amount of change due) based on the purchase. For example, a customer purchasing a first product for \$1.74 and tendering \$2.00 may be offered a second product in lieu of the \$0.26 change due. The upsell price, \$0.26, thus depends on the purchase price

\$1.74. Another type of offering system is a computer-determined "suggestive sell". U.S. Patent No. 5,353,219 describes a system for suggesting items for a customer to purchase at conventional item prices.

In an offering system, there are many possible offers which may be provided to

- 5 customers. For example, in the above-described upsell offer, many different upsells may be offered to a customer in exchange for the particular amount of change due. An offer to a customer at a fast-food restaurant may include a soda, large French fries, or a dessert. Precisely which upsell to offer may be chosen according to a predetermined program at random, or manually by a manager or other operator.

- 10 Unfortunately, random or manual selection of an offer does not necessarily assure that the "best" (highest performing) offers will be provided to customers. What constitutes the "best" offer may be evaluated with respect to one or more criteria, yielding corresponding "performance rates" for the various offers. For example, the acceptance rate of an offer is a performance rate that may be used to evaluate the offer, since some offers  
15 may be less likely to be accepted by customers than other offers. In addition, the profit derived from an accepted offer is another performance rate that may be used to evaluate the offer.

It may be difficult or impossible for a manager or other operator to identify the

- "best" offers (the offers with the highest performance rates). A manager is unlikely to have  
20 knowledge of the true performance rates of a group of offers. A manager is also unlikely to have the time to analyze historical trends to identify the best offers. In addition, at different times of the day or days of the week, certain offers may be more attractive to customers than others. Unanticipated events, such as a high state lottery jackpot or a good article in a magazine, may also make certain offers more attractive. Such circumstances impede

attempts by a manager to identify the best offers. Accordingly, a need exists for controlling offers that are provided at a point-of-sale terminal.

## SUMMARY OF THE INVENTION

5 It is an object of the present invention to provide methods and systems for offering selected products in exchange for the amount of change due at POS terminals.

Generally, according to one aspect of the present invention, a POS terminal determines an upsell to exchange for the change due to a customer in connection with his purchase. The point-of-sale terminal preferably maintains a database of at least one upsell 10 price and a corresponding upsell to offer a customer in exchange for the change due to him. The upsells and upsell prices are established so that upsells are profitably exchanged for the change due, thus providing the business with profit and the customer with value if the upsell is accepted.

When a customer brings a purchase to a POS terminal, the POS terminal generates 15 the purchase price and sets a "required payment amount" to be equal to the purchase price. The required payment amount indicates the amount the customer is expected to pay. The POS terminal then generates a rounded price, preferably by rounding up the purchase price to a whole number, and calculates therefrom a round-up amount equal to the difference between the purchase price and the rounded price. Accordingly, the round-up amount 20 indicates the coins due as change.

By comparing the calculated round-up amount with at least one of the upsell prices in the database, the POS terminal may determine whether the round-up amount corresponds to any of the upsell prices. If so, the POS terminal identifies the upsell corresponding to this upsell price, and outputs signals indicative of the identified upsell. The output signals are

preferably displayed text or graphics that explain to the customer and/or the cashier that the upsell may be purchased for the specified amount of change due.

- If the customer accepts the upsell, the cashier so indicates by pressing a selection button on the POS terminal. The required payment amount for the customer to pay is then 5 set equal to the rounded price, rather than the purchase price. Thus, the customer receives the upsell in exchange for the coins due to him, and the coins need not be exchanged between the customer and the POS terminal.

#### BRIEF DESCRIPTION OF THE DRAWINGS

10

FIG. 1 is a block diagram of a system in accordance with the present invention.

FIG. 2 is a block diagram of the POS controller of FIG. 1.

FIG. 3 is a block diagram of the POS terminal of FIG 1.

FIG. 4 is a block diagram of the lottery data processing system.

15 FIG. 5 is a table depicting the local lottery ticket database within the POS controller of FIG 3.

FIG. 6 is a table depicting the lottery ticket database within the lottery data processing system of FIG 4.

20 FIG. 7 is a table depicting the POS controller database within the lottery data processing system of FIG 4.

FIG. 8 is a flow chart depicting the lottery transaction at the POS terminal.

FIG. 9 is an example of a store sales receipt in accordance with the preferred embodiment of the present invention.

FIG. 10 is a flow chart of the operation of the POS controller.

FIG. 11 is a flow chart of the operation of the lottery data processing system.

FIG. 12 is a flow chart depicting the telephone authentication process.

FIG. 13A is a schematic illustration of a POS terminal provided in accordance with the present invention.

5 FIG. 13B is a schematic illustration of another embodiment of the POS terminal of FIG. 13A.

FIG. 14 is a flow chart illustrating a method of the present invention for determining an upsell at a POS terminal.

FIG. 15 is an exemplary illustration of a storage area of the POS terminal of FIG.

10 13A.

FIG. 16 is a schematic illustration of an upsell database of the POS terminal of FIG. 13A.

FIG. 17 is a schematic illustration of a customer database of the POS terminal of FIG. 13A.

15 FIG. 18 is a schematic illustration of an inventory price database of the POS terminal of FIG. 13A.

FIG. 19 is a schematic illustration of an offered price database of the POS terminal of FIG. 13A.

20 FIG. 20 is a flow chart illustrating a method of the present invention for evaluating a counter-offer for an upsell at a POS terminal.

FIG. 21 is a schematic illustration of an identifier database of the POS terminal of FIG. 13A.

FIG. 22 is a schematic illustration of POS terminal connected to a lottery data processing system.

FIG. 23 is a schematic illustration of another embodiment of the customer database of the POS terminal of FIG. 13A.

FIG. 24A is a flow chart illustrating a method of the present invention for storing customer preferences.

5 FIG. 24B is a flow chart illustrating a method of the present invention for storing customer preferences.

FIG. 25 is a flow chart illustrating a method of the present invention for applying previously-selected customer preferences.

10 FIG. 26 is a flow chart illustrating a method of the present invention for receiving a donated upsell.

FIG. 27 is a flow chart illustrating another method of the present invention for determining an upsell at a POS terminal.

FIG. 28 is a schematic illustration of a network of POS terminals provided in accordance with the present invention.

15 FIG. 29 is a schematic illustration of a store controller of the network of FIG. 28.

FIG. 30 is a schematic illustration of a POS terminal of the network of FIG. 28.

FIG. 31 is a schematic illustration of an alternate embodiment of a POS terminal of the network of FIG. 28.

20 FIG. 32 is a schematic illustration of a ticket supply database of the store controller of FIG. 29.

FIG. 33 is a schematic illustration including exemplary data for the ticket supply database of FIG. 32.

FIG. 34 is a schematic illustration of a transaction database of the store controller of FIG. 29.

FIG. 35 is a schematic illustration of records of a fractional ticket database of the store controller of FIG. 29.

FIG. 36 is a schematic illustration including further exemplary data for the ticket supply database of FIG. 32.

5 FIG. 37 is a flow chart illustrating a method for allocating portions of lottery tickets.

FIG. 38 is a schematic illustration of a winning lottery ticket database of the store controller of FIG. 29.

FIG. 39 is a schematic illustration of a frequent shopper database of the store controller of FIG. 29.

10 FIG. 40 is a flow chart illustrating a method for redeeming a fractional lottery ticket.

FIG. 41 is a schematic illustration of a POS terminal provided in accordance with the present invention.

FIG. 42 is a schematic illustration of another embodiment of the POS terminal of FIG. 41.

15 FIG. 43 is a schematic illustration of an inventory database of the POS terminal of FIG. 41.

FIG. 44 is a schematic illustration of a possible upsells database of the POS terminal of FIG. 41.

20 FIG. 45 is a schematic illustration of an embodiment of an upsell offer database of the POS terminal of FIG. 41.

FIG. 46 is a schematic illustration of another embodiment of the upsell offer database of the POS terminal of FIG. 41.

FIG. 47 is a schematic illustration of another embodiment of the upsell offer database of the POS terminal of FIG. 41.

FIG. 48 is a schematic illustration of another embodiment of the upsell offer database of the POS terminal of FIG. 41.

FIG. 49 is a flow chart illustrating a method for providing a supplementary product sale at a POS terminal.

5 FIG. 50 is a schematic illustration of a POS terminal provided in accordance with the present invention.

FIG. 51 is a schematic illustration of another embodiment of the POS terminal of FIG. 50.

10 FIG. 52 is a flow chart illustrating a method provided in accordance with the present invention for controlling the performance of a supplementary process at a POS terminal.

FIG. 53 is a table illustrating an offer schedule that depends on an activity rate of a POS terminal.

FIG. 54 is a schematic illustration of an override decision manager of the POS terminal of FIG. 51.

15 FIG. 55 is a schematic illustration of a network of POS terminals.

FIG. 56 is a table illustrating an offer schedule that depends on an activity rate of a plurality of POS terminals.

FIG. 57 is a schematic illustration of a POS terminal provided in accordance with the present invention.

20 FIG. 58 is a schematic illustration of another embodiment of the POS terminal of FIG. 57.

FIG. 59 is a schematic illustration of a network of POS terminals.

FIG. 60 is a schematic illustration of an inventory database of a POS terminal.

FIG. 61 is a schematic illustration of a rounding code database of a POS terminal.

25 FIG. 62 is a schematic illustration of data used in determining an amount of money due as payment for items of a purchase and an upsell.

FIG. 63 is a schematic illustration that represents information relating to transactions.

FIG. 64 is a flow chart describing a method for determining a rounded price for a purchase that includes an upsell and one or more items.

5 FIG. 65 is a flow chart describing a method for determining a rounded price for a purchase that includes a plurality of upsells and one or more items.

FIG. 66 is a schematic illustration of data used in determining an amount of money due as payment for items of a purchase and a plurality of upsells.

10 FIG. 67 is a schematic illustration of a POS terminal provided in accordance with the present invention.

FIG. 68 is a schematic illustration of another embodiment of the POS terminal of FIG. 67.

FIG. 69 is a schematic illustration of a network of POS terminals.

FIG. 70 is a table illustrating an embodiment of a database of offers.

15 FIG. 71 is a schematic illustration of a record of a transaction database.

FIG. 72 is a flow chart illustrating a method for controlling offers that are provided at one or more POS terminals.

FIG. 73 is a table illustrating an embodiment of a performance rate database.

FIG. 74 is a table illustrating another embodiment of a performance rate database.

20 FIG. 75 is a schematic illustration of databases employed in determining offers which continue to be provided.

FIG. 76 is a schematic illustration of another embodiment of databases employed in determining offers which continue to be provided.

FIG. 77 is a table illustrating another embodiment of a database of offers.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is directed to a system for performing lottery ticket transactions at

- 5 retail POS terminals without the customer having to wait for two transaction receipts, or go to another check-out terminal to make other non-lottery ticket purchases. In about the same amount of time it takes to ring up bread or milk at a POS terminal, the customer can also purchase a "quick-pick" lottery ticket. This one-stop shopping facilitates the sale of lottery tickets, and speeds the customer on his way. In addition, the present invention enables the
- 10 customer to purchase fractional lottery tickets which even further facilitates the sale of lottery tickets. In particular, in cases where a customer makes other merchandise purchases, instead of receiving change, he can request a fractional lottery ticket (equal to the change amount). Accordingly, the present invention provides a consumer with a convenient and efficient system to purchase lottery tickets.

15

The term "quick-pick" refers to a lottery ticket in which the lottery numbers are randomly generated for the customer by the lottery system.

A fractional lottery ticket is a lottery ticket in which the customer will receive only a portion

- 20 of the winning prize in accordance with the fractional portion paid for the ticket as compared to the full price of a lottery ticket. For example, if a customer pays 58 cents for a fractional lottery ticket where the full price of a lottery ticket is a dollar, the customer would receive fifty-eight percent of the prize amount if the ticket is a winner. As used herein, the term "lottery tickets", or equivalents thereof includes fractional lottery tickets.

FIG. 1 shows an overall system block diagram of a preferred embodiment of the present invention. In this embodiment, a POS controller 20 is linked to at least one POS terminal 30 via a POS network 40. Four POS terminals 30 are depicted in FIG. 1, but any number of

- 5 POS terminals 30 can be used. The POS network 40 does not have to be a hard wired network, it can include any of a wide variety of means suitable to transmit and receive data communications, as described below. A lottery ticket transaction can be initiated from any one of the POS terminals 30. The information required to initiate a lottery ticket transaction is passed between the POS terminal 30 and the POS controller 20 via the POS network 40.
- 10 It is understood that other types of information can also be passed between the POS terminal 30 and the POS controller 20. For example, merchandise prices, coupon discounts, and sales event information can also be passed between the POS terminal 30 and the POS controller 20.
- 15 As illustrated in FIG 1., the POS controller 20 is also linked to a lottery data processing system 60, discussed in detail below, via a data network 50. The data network 50 can be any one or more of a variety of networks capable of data communications. For example, the data network 50 can be a public switched telephone network 76 (PSTN), an integrated service digital network (ISDN), a packet switched network, a private data communication
- 20 network, a wireless network or any other suitable network.

The POS terminals 30 and the POS controller 20 depicted in FIG. 1 may be embodied in hardware specifically provided to implement the present invention. Alternatively, they may be implemented using existing cash registers and central in-store servers. In particular,

many retail stores have computerized cash registers which are coupled to an in-store transaction processor to receive and transmit merchandise price and other merchandise information. The hardware of these systems may be used for the present invention. To incorporate the present invention changes to the existing in-store transaction processor or 5 store network server may be accomplished in various ways, such as reprogramming the existing in-store transaction processor or by adding an additional file server.

- FIG. 2 is a block diagram of the POS controller 20. The POS controller 20 includes a CPU 21 which performs the processing functions. POS controller 20 also includes a read only memory 22 (ROM) and a random access memory 23 (RAM). The ROM 22 is used to store 10 at least some of the program instructions that are to be executed by the CPU 21, such as portions of the operating system or basic input-output system (BIOS), and the RAM 23 is used for temporary storage of data. A clock circuit 24 provides a clock signal which is required by the CPU 21.
- 15 The POS controller 20 also includes a communication port 25 connected to a data network interface 71 and a POS network interface 72. The communication port 25 enables the CPU 21 to communicate with devices external to the POS controller 20. In particular, the communication port 25 permits communication with the POS terminals 30 and also with the lottery data processing system 60. While a modem (not shown) and a dedicated telephone 20 line for establishing communication with the lottery data processing system 60 is preferred, other data network interfaces, including an ISDN terminal to interface with an ISDN network, a radio communications interface, and an Internet interface, may be used as well.

The CPU 21 can also store information to, and read information from, a data storage device

26. The data storage device 26 includes a local lottery ticket database 26a and other databases including a local sales database 26b that a store may conventionally maintain.

The local lottery ticket databasc 26a is described below. In addition, the data storage device

- 5 26 includes instructions which can be read by and executed by the CPU 21, thereby enabling the CPU 21 to process transactions. While FIG. 2 depicts separate databases, a single database that incorporates both functions can also be used. Additional databases may be added as needed to store a variety of other information that may be required for other purposes.

10

FIG. 5 is a pictorial representation depicting the preferred layout and the information stored in the local lottery ticket database 26a. The local lottery ticket database 26a includes a date field F1, a sales receipt number field F2, a number of tickets purchased field F3, a sale amount field F4, and a lottery ticket number field F5. In the case of a fractional lottery  
15 ticket, the sale amount field F4 would contain the fractional amount of the lottery ticket purchased by the customer (e.g., sixty-eight cents).

While only three records R1 for three lottery ticket transactions are depicted in FIG. 5, any number of records may be stored. To conserve storage space on the data storage device 26,

- 20 records may be transferred to a different storage device or deleted after some predetermined time interval or after a predetermined event (e.g. after the winning lottery number drawing).

FIG. 3 is a block diagram of the preferred POS terminal 30, which can be located at a supermarket, grocery store, liquor store or any other location where consumer transactions

are performed. As previously discussed above, there can be any number of POS terminals 30 linked to one POS controller 20. The POS terminal 30 includes a CPU 31, ROM 32, RAM 33, clock circuit 34, communication port 35 and a data storage device 36. The communication port 35 interfaces with the POS network 40 which facilitates

5 communication between the POS terminal 30 and the POS controller 20.

The POS terminal 30 includes an input device 37 to receive input from an operator. Any one of a variety of input devices would be suitable for this purpose, including, for example, depression-actuated buttons, keys, membranes, a mouse, touchscreens, bar code scanners,

10 and the like. The input device 37 may interface directly with the CPU 31, as shown in FIG. 3. Alternatively, an appropriate interface circuit may be placed between the CPU 31 and the input device 37.

The POS terminal 30 also includes a display device 38 for conveying information to the operator, customer or both. Any one or a variety of display devices would be suitable for

15 this purpose, including, for example a CRT, LCD, LED or thin film transistor panel.

The POS terminal 30 also includes a data storage device 36, in which transaction processor instructions are stored. These instructions can be read by and executed by the CPU 31, enabling the POS terminal 30 to process a variety of transaction types. By way of example,

20 these transaction types may include "quick-pick" lottery tickets, lottery tickets other than "quick-pick" tickets and merchandise transactions.

The POS terminal 30 further includes a printer 39 for recording the transaction performed by the POS terminal 30. The printer 39 may interface directly with the CPU 31, as shown in

FIG. 3. Alternatively, an appropriate interface circuit may be placed between the CPU 31 and the printer 39.

It will also be understood that other combinations of POS controllers 20 and POS terminals

- 5 30 could be employed, depending upon the requirements of a particular establishment. In particular, the POS terminal 30 may incorporate some of features of the POS controller 20 so that the integrated POS terminal/controller can function as a stand-alone unit. This type of terminal would be advantageous for establishments that only require a single POS terminal.

10

Shown in FIG. 4 is a block diagram of the lottery data processing system 60. Like the POS controller 20 described above, the lottery data processing system 60 includes a CPU 61, ROM 62, RAM 63, a clock circuit 64, and a communication port 65. The communication

port 65 is connected to the data network interface 71. The data network interface 71

- 15 depicted is equivalent to the data network interface in FIG. 2. One POS controller 20 is depicted in FIG. 1, but any number of POS controllers 20 can be linked to the lottery data processing system 60 via the data network 50 and the data network interface 71.

As shown in FIG. 4, the communication port 65 is also connected to an IVRU interface 74.

- 20 A customer assistance IVRU 75, as shown in FIG. 1, is linked to the lottery data processing system 60 via the IVRU interface 74. The customer assistance IVRU 75 is also connected to the PSTN 76, the public switched telephone network. The customer assistance IVRU 75 allows a caller (not shown) to communicate with the lottery data processing system 60 using a telephone (not shown). Voice command prompts guide the caller through various menu

options allowing the caller to input and extract data related to a particular lottery ticket transaction. This process is described in greater detail below.

The CPU 61 can also store information to, and read information from the data storage device 68. The data storage device 68 includes a lottery ticket database 68a, a POS controller database 68b, and a winning lottery ticket number database 68c which are described below. In addition, the data storage device 68 includes instructions which can be read by and executed by the CPU 61, thereby enabling the CPU 61 to process lottery transactions. While FIG. 4 depicts separate databases, a single database that incorporates all the functions of databases 68a, 68b and 68c can also be used. Additional databases may be added as needed to store a variety of other information that may be useful in maintaining and administrating a lottery system.

The lottery data processing system 60 also includes a random number generator 66 and a cryptographic processor 67. When requested by the CPU 61, the random number generator 66 generates the random "quick-pick" numbers used for "quick-pick" lottery ticket transactions. The cryptographic processor 67 is used to encrypt an authentication code generated by the CPU 61, described in greater detail below. This encrypted authentication code is passed to the CPU 61 which associates it with a particular lottery transaction. The cryptographic processor 67 is also used to decrypt encrypted authentication codes which are passed to it by the CPU 61.

While the illustrated embodiment depicts the random number generator 66 and the cryptographic processor 67 as separate elements within the lottery data processing system

60, it should be understood that other methods of performing their functions may be used. For example, these functions may be implemented in a computer program stored in the data storage device 68 and executed by the CPU 61.

- 5 FIG. 6 is a pictorial representation of the information stored in the lottery ticket database 68a. The lottery ticket database 68a includes a POS controller ID number field F6, a date field F7, a number of tickets purchased field F8, a sales receipt number field F9, a sale amount field F10, a lottery ticket numbers field F11, and a cryptographic code field F12. In the case of a fractional lottery ticket, the sale amount field F10 would contain the fractional  
10 amount of the lottery ticket purchased by the customer (e.g., sixty-eight cents). The POS controller ID number field F6 is a unique code corresponding to each POS controller 20 that communicates with the lottery data processing system 60. The sales receipt number field F9 stores a serial number related to each receipt generated by the POS terminals 30. The cryptographic code field F12 stores the encrypted authentication code, as discussed in detail  
15 below.

While record R2 for one POS controller with ID number 23456 is depicted in FIG. 6, any number of records may be stored. As is also the case with the data storage device 26, from time to time records may be transferred to a different storage device or deleted to conserve  
20 storage space within the data storage device 68. The winning lottery ticket number database 68c is of the other databases that the lottery data processing system conventionally maintains.

FIG. 7 is a pictorial representation depicting the information stored in the POS controller database 68b. The POS controller database 68b includes a POS controller ID number field F13, a POS controller name field F14, a POS controller location field F15, and a telephone number field F16. The POS controller name field F14 stores the name of the store or

- 5 establishment where the POS controller 20 is located. The POS controller location field F15 stores the address of where the POS controller 20 is located. The telephone number field F16 stores the telephone number associated with each POS controller 20. A record R3 for one POS controller location is depicted in FIG. 7, but any number of records may be stored.

- 10 It should be understood that some fields within the databases discussed above would contain the same corresponding information (e.g. POS controller ID number field F6 in the lottery ticket database 68A corresponds to field F13 in the POS controller database 68B).

- FIG. 8 is a flow chart depicting an exemplary lottery ticket transaction process performed at 15 the POS terminal 30 from the customer's point of view. The process starts when a customer indicates to the POS terminal operator that he or she wishes to purchase one or more "quick-pick" lottery tickets in step S1. Of course, the "quick-pick" lottery tickets can be either full or fractional lottery tickets. The customer may make this decision to buy lottery tickets as a stand-alone transaction or while purchasing other merchandise, such as milk or bread. In 20 step S2, the POS terminal operator initiates a lottery transaction by actuating a pre-programmed designation on the input device 37 associated with the POS terminal 30. The customer is then prompted by the POS operator for the number of "quick-pick" lottery tickets desired in step S3.

The number of "quick-pick" lottery tickets may also include fractional lottery tickets. This is convenient for customers who do not want to receive a handful of coins as change from a transaction. For example, a customer due sixty-eight cents in change, from a merchandise purchase could elect to buy a lottery ticket for sixty-eight cents which is worth 68% of a \$1 ticket and which pays-out sixty-eight percent of the \$1 payout. Alternatively, the customer could buy a 34% value of a \$2 ticket with 68 cents. Along with the fractional value lottery tickets, the customer may or course purchase full value lottery tickets.

In an alternative embodiment, the customer may also be prompted for additional lottery

- 10 ticket information, such as the type of lottery game to be played and the particular lottery numbers selected by the customer. For example, a particular lottery system may offer lottery games based on three, four and six number combinations. The customer may also personally select the lottery numbers to be played.

- 15 In step S4, the POS terminal operator enters the number of lottery tickets requested by the customer into the POS terminal 30 via the input device 37. The customer pays for the lottery tickets and any other purchases made at this time in step S5. In step S6, the POS terminal prints a single receipt containing the lottery ticket information and any other merchandise sales information.

20

Shown in FIG. 9 is an example of a store sales receipt 80 according to the one embodiment of the present invention. The store sales receipt 80 includes non-lottery ticket related merchandise information 81. The bottom portion contains lottery ticket information including a plurality of lottery numbers 82, a store ID number 83, a receipt number 84, a

date 85, a time 86, a price 89, a lottery telephone number 87, and an encrypted authentication code 88. In the case of a fractional lottery ticket, the store sales receipt 80 would also include an indication of the fraction of the full price lottery ticket purchased (e.g., as shown in FIG. 9, \$0.68 was paid for ticket 4).

5

FIG. 10 is a flow chart of an exemplary operation of the POS controller 20. The steps of the process shown in FIG. 10 may be implemented in a computer program that may be installed at the POS controller 20 from a computer readable medium and then stored therein in one or more of the ROM 22, the RAM 23 and the data storage device 26 (shown in FIG. 2). The

- 10 POS controller 20 receives in step S7 a lottery ticket transaction request which includes, in this example, the number of "quick-pick" lottery tickets requested by the customer from the POS terminal 30. The POS controller 20 temporarily stores this information in RAM 23, while it establishes a real-time communication link with the lottery data processing system 60 via the data network 50.

15

While one lottery data processing system 60 is depicted in FIG. 1, additional lottery data processing systems may be available as secondary or back-up lottery data processing systems. Accordingly, if the POS controller 20 fails to establish communication with the primary lottery data processing system, communication attempts would be made to a

- 20 secondary lottery data processing system.

Once the real-time communication link is established, the POS controller 20 in step S8 transmits the number of "quick-pick" lottery tickets requested to the lottery data processing system 60. The POS controller 20 also transmits its POS controller identification number

(e.g. F1 in FIG. 7). In step S9, the POS controller 20 receives one or more groups of lottery numbers (corresponding to the number of lottery tickets requested) and an associated encrypted authentication code from the lottery data processing system 60. A new record (e.g. R1 in FIG. 5) is created in the local lottery ticket database (26a in FIG. 2) in step S10.

- 5 In step S11, the POS controller 20 stores in the newly created record the date, receipt number, time, and lottery numbers received from the lottery data processing system (as shown in FIG. 5, F1-F5). The POS controller 20 then transmits the lottery ticket information (i.e. the lottery numbers and the encrypted authentication code) to the POS terminal 30 that initiated the lottery transaction request in step S12.

10

Each of the steps S7-S12 described above is executed by the CPU 21 which is executing computer program instructions stored in the data storage device 26. The communication with the POS terminal 30 takes place via the communication port 25 and the POS network interface 72. The communication with the lottery data processing system 60 takes place via

- 15 the communication port 25 and the data network interface 71.

In an alternative embodiment, the POS controller 20 may also handle non-"quick-pick" lottery ticket transactions. Customer-selected lottery numbers would be received from the customer via mark-sense slips or coded chits at the POS terminal 30 and sent to the lottery

20 data processing system 60 for processing, as described below.

FIG. 11 is a flow chart of the operation of the lottery data processing system 60. The steps of this process may be stored on a computer readable medium which in this case would be the data storage device 68 (shown in FIG. 4). Upon receiving the lottery ticket transaction

request and the POS controller identification number from the POS controller 20, the lottery data processing system 60 in step S13 accesses the POS controller database 68b (shown in FIGS. 4 and 7). The lottery data processing system 60 searches the POS controller database 68b and authenticates the POS controller identification number, as shown in step S14. In 5 step S15, the lottery ticket database 68a (shown in FIGS. 4 and 6) is accessed and a new lottery transaction entry is added in the appropriate POS controller record (e.g. R2 in FIG. 6).

In step S16, the lottery data processing system 60 generates one or more groups of random 10 "quick-pick" lottery numbers using the random number generator 66 (shown in FIG. 4). These random "quick-pick" lottery numbers are used for the quick-pick lottery tickets. The lottery transaction entry added in step S15 is then updated in step S16 by storing these random "quick-pick" lottery numbers in the designated field of the record.

15 The lottery data processing system 60 also generates an authentication code based on the variables of the particular lottery transaction in step S17. This authentication code is a numeric string including all the data of one record in the lottery ticket database 68a. An example of such a code corresponding to the first entry shown in FIG. 6, R2, is as follows:

20 23456/011597004/3343004/011020112131

In this example, 23456 represents the POS controller ID number; 011597 represents the date; 004 represents the number of tickets purchased; 3343 represents the sales receipt

number; 004 represents the sales amount; and 011020112131 represents the lottery ticket numbers.

While the use of an encrypted authentication code is the preferred embodiment, it should

- 5 also be understood that the store sales receipt number along with the date for each transaction may be used instead. In this situation, the sales receipt number and the date would be used as a pointer to the lottery ticket database 68a. This pointer would be used to extract and verify lottery ticket information as required.
- 10 In step S18, using the cryptographic processor 67 (shown in FIG. 4), the authentication code is encrypted to produce a unique numeric code. The lottery transaction entry added in step S15 is then updated again by storing the encrypted authentication code in the appropriate field of the record (see FIG. 6). The use of cryptographic processors and encryption algorithms are well known to those skilled in the art of cryptography. For reference, one of  
15 ordinary skill in the art may refer to Bruce Schneier, *Applied Cryptography, Protocols, Algorithms and Source Code Inc.*, (2nd Edition, John Wiley & Sons, Inc., 1996).

The lottery data processing system 60 then transmits the lottery ticket numbers and the encrypted authentication code to the POS controller 20 initiating the lottery ticket

- 20 transaction in step S19.

This authentication code provides an added level of security and protection for the purchase of the lottery ticket. Should the database within the lottery data processing system 60 be

corrupted, all the information printed on the store receipt lottery ticket can still be verified by any other device capable of decrypting the authentication code.

Each of the steps S13-S19 described above is executed by the CPU 61, which carries out

- 5 these steps by executing computer program instructions stored in the data storage device 68.

The communication with the POS controller 20 takes place via the communication port 65 and the data network interface 71.

In an alternative embodiment, additional information may be transmitted from the POS

controller 20 to the lottery data processing system 60. This could include, as described

- 10 above, customer-selected lottery numbers instead of the random "quick-pick" lottery numbers generated by the lottery data processing system 60. In this situation, the lottery data processing system 60 would store the customer-selected lottery numbers in the lottery ticket database 68a. An encrypted authentication code would be generated accordingly based on the customer-selected lottery numbers. The lottery data processing system 60  
15 would then send the encrypted authentication code and authorization to complete the lottery transaction to the POS controller 20.

FIG. 12 is a flow chart depicting the telephone authentication process. The process starts when a customer dials the telephone number 87 printed on the sales receipt 80, as shown in

- 20 FIG. 9, in step S20. By dialing the telephone number 87, the customer is connected to the customer assistance IVRU 75, as shown in FIG. 1. This unit, via pre-recorded voice messages, prompts the customer to enter the encrypted authentication code 88 printed on the sales receipt 80 using the keys on the telephone in step S21. In step S22, the customer

assistance IVRU 75 communicates this information to the lottery data processing system 60 via the IVRU interface 74, shown in FIG. 4.

In step S23, the lottery data processing system 60 searches the cryptographic code field F12  
5 in the lottery ticket database 68a to find an entry that matches the information provided from the IVRU 75. If no match is found, the lottery data processing system 60 communicates to the IVRU 75 that the encrypted authentication code provided by the customer is not valid.

The IVRU 75 then prompts the customer to re-enter the encrypted authentication code.

After a predetermined number of failed attempts to correctly enter a valid code, the call is  
10 terminated, as shown in step S24.

If a matching entry is found, the lottery data processing system 60 decrypts the encrypted authentication code. The decrypted information is then communicated to the customer assistance IVRU 75 in step S25. Based on this information, the customer assistance IVRU  
15 75 transmits a voice message to the customer providing all the decrypted information (i.e. lottery ticket number, time and date of purchase, etc.). The customer assistance IVRU 75 creates the voice message by combining pre-recorded voice messages stored therein.

A winning lottery ticket may be redeemed at one of the POS terminals 30 or at any  
20 conventional lottery terminal. To redeem the winning lottery ticket at one of the POS terminals 30, the POS terminal operator initiates a lottery ticket verification process by actuating a pre-programmed input designator via input device 37 associated with the POS terminal 30. The POS operator then enters the encrypted authentication code printed on the lottery ticket into the POS terminal 30 via the input device 37. This information is

transmitted to the lottery data processing system 60 via the POS controller 20. The lottery data processing system 60 decrypts this information and accesses the lottery ticket database 68a and the winning lottery ticket number database 68b. The lottery data processing system 60 then determines whether the lottery ticket is a winning lottery ticket based on the  
5 information contained in the respective databases.

This determination (along with other information as needed) is then communicated back to the POS terminal 30 via the POS controller 20. Other types of information that may be included in this communication are, for example, the winning prize amount, the fractional  
10 prize amount, and whether or not there was a jackpot winning ticket.

In an alternative embodiment, the random "quick-pick" lottery numbers used for a lottery ticket transaction may be generated by the POS controller 20. These lottery numbers would then be transmitted to the lottery data processing system 60 as described above.

15

There are thus provided new and improved systems and methods for selling lottery tickets at point-of-sale locations in stores. The invention uses the same equipment provided for processing conventional store sales of merchandise and/or services to process lottery ticket sales.

20

The dual utility of the sales equipment makes the invention cost-effective for merchants. The systems and methods provided permit speedy and efficient purchasing of lottery tickets while making routine purchases of other goods, thus encouraging impulse purchasing of lottery tickets without delaying the regular flow of the point-of-sale checkout line. Further,

the invention enables the quick and efficient sale of fractional lottery tickets with what would otherwise be customer change, again encouraging impulse purchases, thereby increasing the market for lottery tickets.

- 5 The present invention further provides systems and methods whereby an easy to print, easy to read, sales receipt is printed containing both the sales of goods/services and lottery ticket information. The ticket includes authenticating information, including at least one authenticating code and a customer service telephone number, which the customer can use to verify his lottery numbers with the lottery authority.

10

While the present invention has been described above in terms of specific embodiments, it is to be understood that the invention is not intended to be confined or limited to the embodiments disclosed herein. On the contrary, the present invention is intended to cover all methods, structures and modifications thereof included within the spirit and scope of the

15 appended claims.

As used herein, an "upsell" is a product (good or service) which is offered along with a purchase and has a value approximately equal to a predetermined upsell price. Types of upsells which are described in detail herein include (i) an upgrade from a first product to a  
20 second product different from the first product, (ii) an additional product, (iii) a voucher which is redeemable for a product or a discount thereon, and (iv) an entry in a sweepstakes, contest, lottery or other game. Various other types of upsells may be used without departing from the scope and spirit of the present invention.

By offering an upsell in exchange for the customer's change, an average of approximately fifty cents additional revenue is collected per upsell, and the number of coins exchanged is reduced or eliminated. The reduction or elimination of change dispensing and collecting greatly reduces the time a customer spends at a POS terminal. In some cases, it

5 may even be possible to reduce the number of cashiers, if any, who operate POS terminals.

In addition, customers may recognize a greater value from the transaction while reducing or eliminating the need to carry additional change after a purchase.

Further, the present invention allows businesses to more effectively sell aged or perishable products by offering such products in exchange for change due. Such

10 products, such as aging magazines, audio tapes, compact discs, flowers and various perishables can be sold, thereby generating additional revenue and reducing the costs of otherwise disposing of the products. Providing the customer with aged products effectively allows businesses to "pre-qualify" customers to receive discounts on products.

Referring to FIG. 13A, a POS terminal 1010 includes a POS processor 1012 connected to each of an input device 1014, a printer 1016 and a display device 1018. The

15 POS processor 1012 comprises at least one microprocessor 1020, such as an Intel 80386 microprocessor, which is connected to a storage device 1022, such as a RAM, floppy disk, hard disk or combination thereof.

The microprocessor 1020 and the storage device 1022 may each be (i)

20 located entirely within a cash register, vending machine or similar enclosure; (ii) connected thereto by a remote communication link, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination thereof. For example, the POS processor 1012 may comprise one or more cash registers connected to a remote server computer for maintaining databases, or a vending machine connected to a local computer. Many types of

conventional cash registers and other types of POS terminals may be used to implement the present invention in light of the present disclosure. Such terminals may only require software upgrades, which are typically performed without undue effort.

FIG. 13B illustrates another embodiment of the POS terminal 1010 in which

- 5 a first device 1032 communicates with a second device 1034 via a remote communication link 1036. The first device 1032, which may be a cash register, comprises the input device 1014, the display device 1018 and a microprocessor 1037 which performs some of the functions of the microprocessor 1020 of FIG. 13A. The second device 1034 may be, for example, a processing system operated by an electronic marketing service or credit card clearinghouse. The second device 1034 comprises the storage device 1022, the printer 1016 and a microprocessor 1038 which performs some of the functions of the microprocessor 1020 of FIG. 13A.

- Referring again to FIG. 13A, the input device 1014 is preferably a keypad for transmitting input signals, such as signals indicative of a purchase, to the microprocessor 1020. The printer 1016 is for registering indicia on a portion of a roll of paper or other material, thereby printing receipts, coupons and vouchers as commanded by the microprocessor 1020. The display device 1018 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or cashier. Many types of input devices, printers and display devices are known to those skilled in the art, and thus need not 20 be described in detail herein.

The storage device 1022 stores a POS program 1024 for controlling the microprocessor 1020 in accordance with the present invention, and particularly in accordance with the processes described in detail hereinafter. The POS program 1024 also includes necessary program elements, such as "device drivers" for interfacing with each of

the input device 1014, printer 1016 and display device 1018. Appropriate device drivers and other necessary program elements are known to those skilled in the art, and need not be described in detail herein.

- The storage device 1022 also stores a required payment amount 1026, which
- 5 is an amount of money expected to be paid in return for products provided to the customer.
- From the required payment amount 1026, the microprocessor 1020 may determine, for example, the change due and the total amount of money that should have been collected by the POS terminal 1010 at the end of a day. Those skilled in the art will note that the required payment amount may comprise a single stored value or a plurality of values which
- 10 each correspond to an amount of money expected to be paid for one or more products.

The storage device 1022 furthermore stores an inventory price database 1028, which includes products and corresponding product prices. The inventory price database 1028 enables the microprocessor 1020 to calculate a total purchase price of one or more products, and in turn store the total purchase price in the required payment amount 1026.

- 15 An upsell database 1030 stored in the storage device 1022 includes upsells and corresponding upsell prices. An upsell price as used herein is a price, set of prices or range of prices at which it is desirable to sell the corresponding upsell. The upsell price is typically related to the cost of the upsell to the business. For example, if the cost to a restaurant is 20¢ for a small soda, then the upsell price of one additional small soda is a
- 20 range greater than 20¢, such as the range from 20¢ to 30¢. As another example, if the cost to the restaurant is 22¢ for a large soda, then the cost of an upsell from a small soda to a large soda for the restaurant is the incremental cost  $22¢ - 20¢ = 2¢$ . Accordingly, the upsell price may possibly be a range having a lower bound of 2¢.

In addition, it is desirable that the upsell price has an upper bound that is less than a predetermined amount. For example, an upsell price should not exceed the price of a product offered as an upsell. Using the example given above, the upsell price for an upgrade from a small soda to a large soda is a range with a lower bound of 2¢. An upper bound for  
5 this upsell price should not exceed the cost of a large soda, for example, 90¢. Otherwise, the customer would pay more than the price he would have paid if he had included a large soda in his purchase. Proposing such a transaction to the customer, for example, 95¢ in exchange for a 90¢ large soda, is likely to be ineffective, as well as insulting to the customer.

In general, the price of a product to a customer is different from the cost of

- 10 the product to the business that offers the product. Therefore, the upsell prices in the upsell database 1030 cannot be ascertained from only the product prices in the inventory price database 1028, but must be calculated so as to yield a profit. For example, the inventory price database 1028 may indicate that the price of a small soda is 55¢ and the price of a  
large soda is 90¢. From these two prices alone, it is impossible to determine that the cost to  
15 a restaurant is 20¢ for a small soda and 22¢ for a large soda, and thus that the cost of such an upsell from small to large soda is 2¢. Accordingly, it is impossible to determine, from the inventory price database 1028 alone, that it would be profitable for the restaurant to profitably provide the upsell for relatively small upsell prices, such as 5¢ or 10¢. Such a profit point can only be determined as a function of the costs.

- 20 The above-described difference between the prices of products to customers and the costs of the products to the business permits the POS terminal to determine upsells which (i) are profitably sold for the change due to a customer, and also (ii) provide the customer with a product at a reduced price, in exchange for his change. Providing the product at a reduced price tends to increase customer satisfaction, generate additional

revenue for the business and increase inventory turnover. At the same time, the prices of products need not be reduced, and thus the profits from sales of these products (besides upsells) remain substantially or completely unaffected by offering upsells.

One type of upsell, which several kinds of businesses may offer, is an

- 5 upgrade from a first product to a second product. Accordingly, a combination of (i) a purchase including a first product, and (ii) an upsell including an upgrade from a first product to a second product would effectively result in the upgrade from the first product to the second product. A restaurant, for example, may offer an upsell comprising an upgrade from a small soda to a large soda, or an upgrade from a plain taco to a deluxe taco. An  
10 electronics store may offer an upsell that extends the effective term of a warranty.

Another type of upsell is an additional product to supplement the customer's purchase. For example, a restaurant may offer an upsell comprising a promotional cup or a dessert; a video store may offer an upsell comprising a movie rental ticket, additional videotape or promotional hat; a vending machine may offer an upsell that provides an extra  
15 candy bar; an appliance store may offer an upsell comprising a warranty; and a supermarket may offer an upsell comprising any one item from a bin of perishable goods. Such a supermarket upsell is particularly advantageous in generating revenue and liquidating  
perishable products.

FIG. 14 illustrates a method 1040 for determining an upsell of a purchase at a

- 20 POS terminal. The POS terminal of this embodiment, for example the POS terminal 1010, maintains a database of upsell prices and corresponding upsells (step 1042). The POS terminal furthermore generates a purchase price of a purchase (step 1044), and sets the required payment amount 1026 (FIG. 13A) to be equal to the purchase price (step 1046).  
The step of generating a purchase price may comprise, for example, (i) pressing keys on the

input device 1014 (FIG. 13A) which each correspond to a product, (ii) pressing numeric keys on the input device 1014 which correspond to the digits of the purchase price, or (iii) receiving digital signals indicative of a currency value from a remote computing device.

The POS terminal then generates a "rounded" price (step 1048), and

- 5 calculates a round-up amount (step 1050) equal to the difference between the purchase price and the rounded price. The rounded price may be calculated as, for example, the smallest whole number dollar amount that is greater than the purchase price, the smallest multiple of five dollar amount that is greater than the purchase price, or the amount of money tendered by the customer, which may or may not be a whole number amount. When the rounded
  - 10 price is a whole number, the customer can easily tender bills and in turn receive, at his discretion, either (i) no change, or (ii) change which consists solely of bills, not coins.
- When the rounded price is a multiple of large coins, such as nickels, dimes, quarters or half dollars, the customer can receive change that consists solely of coins the customer desires, such as quarters. Many other forms of rounded prices may be calculated in accordance with
- 15 the present invention.

- The POS terminal then determines at least one upsell to be exchanged for the round-up amount (change due). Preferably, to identify the upsell, the POS terminal compares the round-up amount with at least one of the upsell prices in the upsell database (step 1052) to identify at least one upsell having an upsell price including the round-up
- 20 amount. If the round-up amount corresponds to an upsell price (step 1054), the POS terminal identifies an upsell (step 1056) which corresponds to that upsell price, thereby identifying the upsell to exchange. The POS terminal then outputs signals indicative of the identified upsell (step 1058), such as displaying text and/or graphics that explain to the

customer and/or the cashier that the identified upsell may be purchased for the round-up amount.

- The customer indicates to the cashier whether he accepts or rejects the offered upsell. The cashier then presses a button on the POS terminal or otherwise generates a selection signal for indicating selection between the identified upsell and change (step 5 1060). If the selection signal indicates selection of the upsell, the required payment amount is set to be equal to the rounded price (step 1062). Thus, the customer tenders cash, a check or a credit card to satisfy the amount of money expected to be paid, and receives the upsell in exchange for the round-up amount.

- 10 As discussed above, those skilled in the art will realize that the required payment amount may comprise a single stored value or a plurality of values which each correspond to an amount of money expected to be paid for one or more products. For example, the step 1062 of setting the required payment amount to be equal to the rounded price may comprise (i) setting a stored unitary value to be equal to the rounded price; or (ii) 15 setting a first stored value to be equal to the purchase price and setting a second stored value to be equal to the round-up amount, similar to the case where two purchases are recorded.

- In the example illustrated in FIG. 15, a customer at a fast-food restaurant orders a purchase that includes a hamburger and a small soda. A cashier records the purchase at a POS terminal, and the POS terminal in turn determines the product prices of 20 each of the hamburger and the small soda from entries 1070 and 1072 in the inventory price database 1028. The POS terminal generates therefrom the purchase price \$1.62, and sets the required payment amount 1026 to be \$1.62.

The POS terminal then generates a "rounded" price of \$2.00 (using, in this example, "2" as the smallest whole number which is greater than the purchase price), and

calculates a round-up amount 1074 of \$2.00 - \$1.62 = 38¢. Since the rounded price is a whole number, the customer may easily tender bills and receive either no change or change which consists solely of bills, not coins.

- The POS terminal compares the round-up amount 1074 with at least one of
- 5 the upsell prices in the upsell database 1030. The round-up amount 74 corresponds to a compared upsell price 1076 (the range from 2¢ to 45¢), and the product sold (small soda) corresponds to the upsell condition 1078, so the POS terminal identifies an upsell 80 in the upsell database 1030 which corresponds to the upsell price 1076. The POS terminal then displays text or graphics that explain to the customer and/or the cashier that the upsell 1080
  - 10 may be purchased for the specified amount of change due (the round-up amount 1074).

- The customer indicates to the cashier whether he accepts or rejects the offered upsell. The cashier then presses a button on the POS terminal or otherwise generates a selection signal for indicating selection between the identified upsell 1080 and change. If the selection signal does not indicate selection of change, but instead selection of the upsell
- 15 1080, the required payment amount 1026 is set to be equal to the rounded price. Thus, the customer receives the upsell (an upgrade from a small soda to a large soda), and there are no coins due.

- In some embodiments of the present invention, the POS terminal determines the upsell(s) by identifying at least one upsell in the database that corresponds to the
- 20 compared upsell price. For example, an upsell comprising a small soda may correspond to an upsell price range of between 2¢ and 20¢. In other embodiments, the POS terminal determines the upsell(s) by identifying at least one upsell in the database which corresponds to both (i) the compared upsell price, and (ii) at least one "purchase condition".

A purchase condition is a condition in effect when the purchase is processed at the POS terminal. Some types of purchase conditions are the purchase price, time of day, day of the week, season, the identity of a product included in the purchase, the cost of a product included in the purchase, and/or past purchases made by the customer. Other types 5 of purchase conditions may be employed without departing from the spirit and scope of the present invention.

The use of purchase conditions in the present invention allows upsells to be more accurately determined, and in turn increases the likelihood that an upsell will appeal to a customer and be exchanged for change due. For example, at certain times during a day, a 10 customer may have a stronger desire for certain upsells. A meal is a more appealing upsell during dinnertime than during the mid-afternoon, and a video rental is more appealing in the evening than in the morning. Accordingly, consideration of the time of a purchase may allow more appealing upsells to be offered.

In embodiments that employ purchase conditions, upsell prices in the upsell 15 database have a corresponding upsell and at least one corresponding upsell condition to compare with the purchase condition. Furthermore, the POS terminal generates the purchase condition(s) in any of a number of ways. For example, a clock signal can provide the time and/or date, the purchase recorded by the POS terminal can provide the identity of products, and a "frequent shopper card" can provide signals indicative of the customer's 20 identity and past purchases made by the customer.

Referring to FIG. 16, an upsell database 1090, which is one embodiment of the upsell database 1030 of FIG. 13A, includes upsell prices 1092, upsell descriptors 1094 and a plurality of upsell conditions, including the items purchased 1096, whether a customer identifier is required 1098, customer product preferences 1100, the time of day 1102 and

cost 1103 to the business. The entries in the upsell database 1090 may be uniquely identified by upsell codes 1104.

Several types of purchase conditions, which are compared with upsell conditions, may be stored in one or more databases in the storage device 1022 (FIG. 13A).

- 5 For example, FIG. 17 illustrates a customer database 1110, which includes unique customer identifiers 1112, as well as customer-specific information, such as name 1114, address 1116, telephone number 1118 and historical product preferences 1120. The POS terminal 1010 (FIG. 13A) may employ the customer database 1110 to determine various purchase conditions, and offer upsells accordingly as described above. A customer at a POS terminal 10 10 may provide a corresponding customer identifier, and thereby provide his customer-specific information, in any of a number of ways. For example, the customer may type his customer identifier into the POS terminal, or may "swipe" (pass) a frequent-shopper card containing a unique identification code through a card reader at the POS terminal.

Other types of purchase conditions may be derived from an inventory price

- 15 Referring to FIG. 18, an inventory price database 1130, which is one embodiment of the inventory price database 1028 of FIG. 13A, includes products 1132 and corresponding product prices 1134. The inventory price database 1130 may also include unique product identifiers 1136, as well as the numbers of such products in stock 1138. It may also be desirable to store the "age" (expiration date or time) 1140 of certain types of 20 products, thus allowing older products to be identified and offered as upsells.

For each purchase, the above-described purchase conditions, the round-up amount and whether the upsell was selected may be stored in a database of offered upsells. Such a database of offered upsells could provide information on which upsells were accepted by customers, and under what circumstances the upsells were accepted. Thus,

from this database, the value of upsells to consumers may be determined, and the upsell database can be adjusted accordingly. For example, if consumers rarely accept a certain upsell, the upsell may be eliminated from the database or may be offered in exchange for much smaller amounts of change.

- 5 FIG. 19 illustrates an embodiment of an offered upsell database 1150 stored in the storage device 1022 (FIG. 13A). The offered upsell database 1150 includes upsells which were offered 1152, the corresponding round-up amount 1154 and which upsell, if any, was accepted 1156. Other purchase conditions may be desirable to store in the offered upsell database 1150, such as the date 1158 of the offered upsell, a unique customer  
10 identifier 1160, an expiration period 1162 for redeeming the upsell, if any, and the date 1164 the upsell was accepted (redeemed), if any.

- In the embodiments discussed above, the POS terminal identified a single upsell to offer in exchange for a round-up amount. However, the POS terminal 1010 (FIG. 13A) may identify more than one upsell that corresponds to an upsell price. In such an  
15 embodiment, the POS terminal 1010 can provide the customer with a selection of possible upsells. The POS terminal 1010 may display all of these upsells simultaneously, or may display the upsells sequentially.

- In embodiments where the upsells are displayed simultaneously, the customer selects from among the displayed upsells. In embodiments where the upsells are  
20 displayed sequentially, the customer may reject (fail to select) the first displayed upsell, and the POS terminal 1010 then displays a second upsell. Sequentially-displayed upsells can be sorted according to a sorting criteria, allowing the sequence of displayed upsells to proceed in a desired manner. Thus, a first upsell that is sorted before a second upsell is displayed first. If the first upsell is not selected, the second upsell is then displayed.

The upsells may be sorted according to the profit earned on each upsell. In such an embodiment, the upsell yielding the highest profit to the business is offered first. If the customer rejects the highest profit upsell, other upsells having lower profits may be subsequently-displayed. Thus, even if a customer rejects a first upsell, he may select a  
5 subsequent upsell that still provides profit to the seller.

In certain other embodiments of the present invention, the POS terminal provides a second upsell having a higher-value to the customer if a first upsell has been rejected. Such a higher-value upsell may be more likely to be accepted than the first upsell.  
10 Such a sequence of increasingly-valuable offers may result in the customer's consistent rejection of the first upsell offer. Accordingly, in another embodiment, the POS terminal generates a random number using any of a number of known methods. The random number may be used to determine (i) whether subsequent upsells are offered at all, or (ii) the relative order in which the upsells of different value will be offered. Thus, customers are unsure of whether a second upsell will be offered and/or what the value of a second upsell may be, so  
15 they will not automatically reject the first upsell.

FIG. 20 illustrates a method 1180 in which the customer provides a counter-offer to exchange his change for a second upsell. The POS terminal then determines whether to accept this counter-offer.

As described above, the POS terminal outputs signals indicative of a first  
20 (identified) upsell (step 1182). The POS terminal generates a selection signal for indicating selection between the first upsell, change and a second upsell (counter-offer by customer). If the selection signal indicates selection of the first upsell (step 1184), then, as described above, the required payment amount is set equal to the purchase price (step 1186). However, if the selection signal indicates selection of the second upsell (step 1188) (i.e., the

customer counter-offers for the second upsell), a second upsell price corresponding to the second upsell is determined (step 1190) from the upsell database. If the calculated round-up amount corresponds to the second upsell price (step 1192) (i.e., the customer's change is sufficient for the second upsell), the required payment amount is set to be equal to the  
5 rounded price (step 1186), and the second upsell is thereby accepted.

Besides product upgrades and additional products, another type of upsell is a voucher that is redeemable for a product or a discount thereon. Vouchers can be especially valuable to a seller because they attract customers back to a business and possibly provide repeat sales. A customer is typically more likely to return to a business to use a purchased  
10 voucher (i.e. purchased with his change) than to use a free voucher. Vouchers provide further value to the seller through the possibility of breakage (i.e. loss and thus non-redemption of a purchased voucher).

A voucher may either be related to the round-up amount or independent thereof. For example, one type of voucher is a coupon redeemable for a discount on a future  
15 purchase, in which the discount amount is equal to the round-up amount of the present purchase. In contrast, another type of voucher is a coupon redeemable for a certain product, regardless of the round-up amount of the present purchase.

Upon accepting the upsell, either the cashier presents a pre-printed coupon to the customer, or the POS terminal prints one for the customer. Printed vouchers may be  
20 registered with many different types of indicia, such as redemption information, a unique identifier, the date of the purchase or an expiration date.

In embodiments that include printing a unique identifier on the voucher, the POS terminal maintains a database for storing a plurality of identifiers. When a new voucher must be printed, the POS terminal generates a unique identifier that does not

already exist in the identifier database. This identifier is then stored in the identifier database. By searching the identifier database for a voucher identifier, redemption of the voucher may be tracked and the same voucher cannot be redeemed more times than permissible.

- 5 Referring to FIG. 21, the storage device 1022 stores an identifier database 200, which includes unique identifiers 1202 for identifying each voucher. The identifier database 1200 may further include voucher face values 1204, which may (or may not) equal the round-up amount exchanged for the voucher. Stored voucher face values allow each voucher to be redeemed for a different value, while minimizing fraud. For example, the
- 10 1204 stored in the database 1200 may be retrieved upon redemption and compared with values printed on the vouchers. Discrepancies between stored and printed voucher values would indicate forgery of the printed voucher.

- Yet another type of upsell is an entry in a game, such as a lottery, contest, sweepstakes or other game. In some embodiments, the prize for winning the game depends
- 15 120 on the round-up amount used to purchase the game entry. For example, the prize for winning the game may be proportional to the round-up amount paid for the game entry. In such embodiments, the prize collected upon winning the game is greater for greater round-up amounts. In other embodiments, the probability of winning may be greater for greater round-up amounts. For example, a game entry for which a customer paid \$1.50 may have
- 20 twice as much of a chance of winning as a game entry for which another customer paid 75¢.

Upon receiving an input indicating selection of the game upsell in exchange for the round-up amount, the POS terminal generates a unique identifier to identify the game entry. The unique identifier and the round-up amount are stored in a game database of identifiers and round-up amounts. When a winning entry is determined, the game database

provides the round-up amount corresponding to the entry, and thereby determines the prize value.

The game database may be, for example, a database maintained by the POS terminal and stored in the storage device 1022 (FIG. 13A). In another embodiment

- 5 illustrated by FIG. 2210, the game database resides in a lottery data processing system 1220 that is connected to POS terminals 1222 and 1223 through a communication link 1224.

Although two POS terminals are shown in FIG. 22 for purposes of clarity, more POS terminals may be connected to the lottery data processing system 1220.

The lottery data processing system 1220 is typically a controller located in a

- 10 store for controlling lottery ticket transactions performed at POS terminals in the store. The system 1220 thereby serves to collect and store lottery transactions (such as lottery ticket upsells) performed at the store's POS terminals. Such centralized control of lottery transactions allows customers at a number of POS terminals to each receive upsells that permit participation in a single lottery, contest or other game.

- 15 The lottery data processing system 1220 comprises a microprocessor 1226 for controlling other components described below. The microprocessor 1226 communicates with each of a cryptographic processor 1228 for authenticating lottery transactions and a random number generator 1230 for generating "quick-pick" lottery numbers for each game entry. A storage device 1232 also communicates with the microprocessor 1226, and stores  
20 (i) the above-described game database 1234 of identifiers and round-up amounts; (ii) a POS terminal controller database 1236 for maintaining information on POS terminals connected to the lottery data processing system 1220, such as a unique identifier for each terminal and the specific lottery transactions of each terminal; and (iii) a winning lottery ticket number database 1238 for storing winning numbers, and thereby indicating winning entries.

- In each of the embodiments of the present invention described above, the customer selects and receives an upsell. However, as described below, the customer may prefer to transfer ("donate") his upsell to a second customer, with the upsell being received by the second customer at his next visit to a POS terminal. The second customer may visit 5 the POS terminal, for example, to pay for products, as described above, or specifically to collect the donated upsell.

FIG. 23 depicts a customer database 1260 which is another embodiment of the customer database 1110 (FIG. 17) stored in the storage device 1022. The customer database 1260 includes unique customer identifiers 1262, as well as customer-specific 10 information described above, such as name 1264, address 1266, telephone number 1268 and historical product preferences 1270. In addition, the customer database 1260 includes linked customer identifiers 1272 that identify others (if any) to which the customer's upsells are donated.

For example, using the functionality of the customer database 1260, a 15 customer may specify that an acquaintance receives the customer-earned upsell. The customer database 1260 also includes upsells due 1274 to the customer, such as upsells previously earned or transferred to him by another, as well as upsell expiration dates 1275 indicating the last dates for receiving the upsells due.

Using the exemplary data shown in the database 1260 of FIG. 23, a first 20 customer identifier 1276 of the record 1277 identifies a customer name "Bill Smith" and further identifies a corresponding linked customer through identifier 1278 in field 1272. This linked customer identifier 1278 corresponds to the customer identifier 1280 identifying the customer "Jill Smith". Accordingly, Jill Smith has been identified and receives upsells 25 donated by Bill Smith.

An upsell due 1282 is associated with customer identifier 1280 of record 1281 (Jill Smith). The upsell due 1282 is provided based on a purchase by Bill Smith, and is collected by Jill Smith during a visit to a POS terminal. The upsell identifier "A" in field 1274 may comprise, for example, a small soda. Thus, the use of "linked customers" thus 5 allows customers to transfer earned upsells, or even purchased products, thereby increasing both customer satisfaction and customer retention.

A customer may prefer to randomly donate his upsell to one (or more) of a number of customers, such as a number of family members or a predetermined list of needy families, rather than to any one customer in particular. In such an embodiment, the donating 10 customer may first designate an associated group of linked customer identifiers 1272. Alternatively, the customer may let the store select a group of customers. A random one (or more) of this group is selected by the POS terminal as the recipient of the upsell.

Referring now to Figs. 12a and 12b, a process 1300 is shown whereby automated upsell processing is performed for a customer having a frequent shopper card. A 15 customer who wishes to register for a frequent shopper card which stores his preferences provides personal information (step 1302), such as his name, address and/or telephone number, to a POS operator or other person responsible for data entry. This personal information is then stored (step 1304) in a record of the customer database. Such records are exemplified in FIG. 23 by the records 1276 and 1281 of the customer database 1260.

20 The customer selects (step 1306) if he would like to normally receive an upsell, rather than change. If he so selects, possible choices of upsells are displayed (step 1308) to the customer. The customer chooses which of the displayed upsells he prefers to normally receive (step 1310), and the chosen upsell is stored (step 1312) in the historical preferences field 1270 of his customer record.

The customer may also choose (step 1314) if he would like to donate his upsells to a "linked" customer having a frequent shopper card. If so, the customer provides information (step 1316) identifying the linked customer, such as the name, address and/or account number of the linked customer. The customer may select multiple other linked

5 customers to receive donated upsells. The information is verified (step 1318) to assure that the second customer may be properly identified from the information provided, and the information is stored in the customer database record. As necessary, additional customer records are created for second and subsequent customer(s).

Possible upsells to donate to the second customer are displayed (step 1320) to

10 the customer. The customer chooses which of the displayed upsells he prefers to normally transfer (step 1322), and the chosen upsell is stored (step 1324) in the customer record. Finally, the customer is issued his frequent shopper card (step 1326) through which the POS terminal may identify his customer record.

Referring to FIG. 25, a method 1340 for applying previously-selected

15 customer preferences to a current visit to a POS terminal begins with a determination (step 1342) of whether a frequent shopper card is being used. Such a determination may be made, for example, by receiving a signal from a card reader, thereby indicating that a card has been "swiped" through the card reader. If a frequent shopper card is not being used, an upsell is determined (step 1344) as previously described, and an upsell (if selected) is provided to the

20 customer (step 1346) in exchange for his change.

If a frequent shopper card is being used, the customer database is searched to determine (step 1348) if the customer has a preferred upsell. If he does, the preferred upsell is selected (step 1350). The customer database is also searched to determine (step 1352) if the customer has established a second customer to receive donated upsells. If so, an

identifier for the selected upsell is stored (step 1354) in an account of the second customer, thereby indicating that the second customer may receive the selected upsell. In other embodiments, the second customer may receive donated products that are not upsells, such as products bought for "list" price.

- 5 Referring now to FIG. 26, a method 1370 illustrates how the second customer may receive the donated upsell. While at the POS terminal, the second customer swipes his frequent shopper card through a card reader (step 1372), thereby identifying a customer record of the customer database providing information on his preferences and any upsells donated to him. The customer record is searched to determine (step 1374) if an  
10 upsell has been donated to the second customer. If not, the second customer completes his transaction (step 1376) at the POS terminal as described above. If an upsell has been donated, the second customer is informed and the upsell is provided (step 1378), thereby clearing the donated upsell from the record of the second customer. A transaction-specific upsell, dependent on the change of the second customer, can be offered in addition to the  
15 donated upsell.

- As described above, an upsell may have a corresponding expiration date after which the upsell may not be redeemed. For example, a donated upsell may be transferred only if the second customer collects the upsell through the above-described method 1370 (FIG. 26) before a predetermined date. An expiration date for donated upsells is especially  
20 advantageous to a store in that it can increase customer retention by providing an incentive to visit the store having the POS terminals before the upsell expires. Breakage also provides the store with profit.

In many of the embodiments presented herein, the methods and apparatus of the present invention have been described in detail with respect to a single device

functioning as a POS terminal, such as a cash register. However, as also described above, the functionality of the present invention may be implemented by a plurality of devices sharing the described functionality, such as the multi-unit system illustrated in FIG. 13B.

Accordingly, FIG. 27 illustrates a method 1390 for determining an upsell at a

- 5 POS terminal in accordance with the embodiment of FIG. 13B. The method 1390 may be performed, for example, by a combination of a cash register and a processing system operated by an electronic marketing service or credit card clearing house. The cash register generates a purchase price and transmits the purchase price to the processing system (step 1392).

- 10 The processing system generates a rounded price (step 1394), and generates a round-up amount in dependence thereupon (step 1396). As described above, the processing system identifies an upsell to offer to the customer (step 1398). If the customer selects the upsell (step 1400), then the required payment amount of the cash register is set, manually or automatically through a connection with the processing system to the rounded price (step 15 1402).

It will be understood by those skilled in the art that many different systems may be provided wherein the functionality of the present invention is shared amongst multiple hardware and/or software devices.

- Although the present invention has been described with respect to a preferred embodiment thereof, those skilled in the art will understand that various substitutions may be made to those embodiments described herein without departing from the spirit and scope of the present invention. For example, many other types of upsells that are not discussed in detail herein are contemplated by the present invention. One such upsell may comprise "points", such as those redeemable for store credit, telephone calls, Internet access or pay

television events. Furthermore, many types of POS terminals, besides those requiring cashiers, are contemplated by the present invention.

In accordance with the present invention, a business may acquire a lottery ticket, and

- 5 allocate a portion of the lottery ticket to a customer. A share of any prize that is won with the lottery ticket is provided to the customer, the share of the prize corresponding to the allocated portion of the lottery ticket. For example, if a customer receives a \$0.34 portion of a \$2.00 lottery ticket, then the customer receives 17% ( $\$0.34 / \$2.00 = 17\%$ ) of the prize derived from the lottery ticket. A portion of a lottery ticket may be expressed as a monetary value, such \$0.34, and may be expressed as a percentage, such as 17%.
- 10

Typically, the business will acquire a group of lottery tickets and allocate portions of those lottery tickets to customers as needed. The prizes derived from the group of lottery tickets are received by the business, which in turn pays shares of the prizes to customers based on the allocated portions. Since the business need only purchase conventional lottery tickets, the business may facilitate the play of fractional lottery tickets without requiring significant changes in existing lottery agency practices.

The portion of the lottery ticket allocated to the customer may be based on a change amount that is due in connection with a transaction at a POS terminal. Such an embodiment is advantageous since many customers will welcome an alternative to receiving change.

- 15
- 20
- Moreover, receiving something having a high perceived value, such as a fractional lottery ticket, instead of change can be even more attractive to customers.

Referring to FIG. 28, a network 2008 comprises a store controller 2010, which is in communication with a lottery server 2012 and with POS terminals 2014, 2016, 2018 and 2020. The POS terminals 2014, 2016, 2018 and 2020, which are typically cash registers or

other terminals, may initiate and/or complete fractional lottery ticket transactions. Although four POS terminals are shown in FIG. 28, any number of POS terminals may be in communication with the store controller 2010. The POS terminals 2014, 2016, 2018 and 2020 may be located in the same store, in different stores of a chain of stores, or in other 5 locations.

The store controller 2010 directs the operation of, stores data from and transmits data to the POS terminals 2014, 2016, 2018 and 2020. The store controller 2010 may itself be a POS terminal or may be another computing device that can communicate with one or more POS terminals. The lottery server 2012 is typically controlled by a state lottery agency, and 10 responds to requests from the store controller 2010. For example, the lottery server 2012 may issue lottery tickets as requested by the store controller 2010, and may provide the winning numbers for a drawing date.

Referring to FIG. 29, the store controller 2010 of FIG. 28 comprises a processor 2022, such as one or more conventional microprocessors. The processor 2022 is in 15 communication with a data storage device 2024, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 2022 and the storage device 2024 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication link, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination thereof. For 20 example, the store controller 2010 may comprise one or more computers that are connected to a remote server computer for maintaining databases.

The storage device 2024 stores a program 2026 for controlling the processor 2022. The processor 2022 performs instructions of the program 2026, and thereby operates in accordance with the present invention, and particularly in accordance with the methods

described in detail herein. The program 2026 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 2022 to interface with computer peripheral devices. Appropriate device drivers and other necessary program elements are known to those skilled in the art, and need not be

5 described in detail herein.

- The storage device 2024 also stores (i) a ticket supply database 2030; (ii) a transaction database 2032; (iii) a fractional ticket database 2034; (iv) a winning lottery ticket database 2036; and (v) a frequent shopper database 2038. The databases 2030, 2032, 2034, 2036 and 2038 are described in detail below and depicted with exemplary entries in
- 10 the accompanying figures. As will be understood by those skilled in the art, the schematic illustrations of and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides the tables shown. Similarly, the illustrated entries represent exemplary information, but those skilled in the art will understand that the number
- 15 and content of the entries can be different from those illustrated herein.

- Referring to FIG. 30, a schematic illustration of a POS terminal 2040 is descriptive of the POS terminals 2014, 2016, 2018 and 2020 of FIG. 28. The POS terminal 2040 comprises a processor 2042, such as one or more conventional microprocessors. The processor 2042 is in communication with a data storage device 2044, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 2042 and the storage device 2044 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication link, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination

thereof. For example, the POS terminal 2040 may comprise one or more computers which are connected to a remote server computer for maintaining databases.

An input device 2046, a printer 2048 and a display device 2050 are each in communication with the processor 2042. The input device 2046 preferably comprises a keypad for transmitting input signals, such as signals indicative of a purchase, to the processor 2042. The input device 2046 may also comprise an optical bar code scanner for reading bar codes and transmitting signals indicative of those bar codes to the processor 2042. The printer 2048 is for registering indicia on paper or other material, thereby printing fractional lottery tickets as commanded by the processor 2042. The display device 2050 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or a cashier operating the POS terminal 2040. Many types of input devices, printers and display devices are known to those skilled in the art, and need not be described in detail herein.

The storage device 2044 stores a POS terminal program 2052 for controlling the processor 2042. The processor 2042 performs instructions of the POS terminal program 2052, and thereby operates in accordance with the present invention, and particularly in accordance with the methods described in detail herein. The POS terminal program 2052 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 2042 to interface with computer peripheral devices, such as the input device 2046, the printer 2048 and the display device 2050.

Appropriate device drivers and other necessary program elements are known to those skilled in the art, and need not be described in detail herein.

FIG. 31 illustrates an alternate embodiment of a POS terminal 2058, which is descriptive of the POS terminals 2014, 2016, 2018 and 2020 of FIG. 28. A control device

2060 is in communication via a communication medium 2062 with a system 2064 for printing fractional lottery tickets, receipts and/or coupons. The control device 2060 comprises a processor 2066 that is in communication with the input device 2046 (FIG. 30) and the display device 2050 (FIG. 30). The system 2064 for printing comprises a processor 5 2068 in communication with the storage device 2044 (FIG. 30) and the printer 2048 (FIG. 30). In this embodiment, the control device 2060 may be a cash register, and the system 2064 may be an electronic device for printing tickets in accordance with data received from the cash register. Other configurations of the POS terminal 2040 will be understood by those skilled in the art.

- 10 The description that follows is arranged into the following sections: Allocating Portions of Lottery Tickets, Acquiring Additional Lottery Tickets, and Redeeming Portions of Lottery Tickets.

#### Allocating Portions of Lottery Tickets

- 15 Referring to FIG. 32, the ticket supply database 2030 of FIG. 29 includes rows 2080, 2082, 2084, 2086 and 2088, each of which represents an entry of the ticket supply database 2030. Each entry defines a lottery ticket that is to be allocated, in which the allocated portions of the lottery ticket are included in fractional lottery tickets. In particular, each 20 entry includes (i) a ticket identifier 2090 that uniquely identifies the entry, such as a serial number of the lottery ticket or a portion of the serial number; (ii) a drawing date 2092 that indicates when winning ticket numbers will be announced; (iii) ticket numbers 2094; (iv) an unallocated portion 2096 of the lottery ticket; and (v) a ticket price 2098, which indicates the total of the unallocated portion 2096 and any allocated portions. For any entry, the

unallocated portion 2096 and the ticket price 2098 may be used to determine how much of the corresponding lottery ticket has been allocated. For example, referring to the entry 2084, of the \$1.00 ticket price, \$0.23 remains unallocated. Accordingly, \$0.77 (\$1.00 - \$0.23) has been allocated. A total remaining unallocated amount 2100 indicates the sum of 5 the unallocated portions of all lottery tickets. Given the exemplary data shown in FIG. 31, the total remaining unallocated amount 2100 is \$1.54 (\$0.12 + \$0.31 + \$0.23 + \$0.78 + \$0.10 = \$1.54).

Referring to FIG. 33, exemplary data for the ticket supply database 2030 (FIGS. 29 and 32) are shown before and after a portion of a lottery ticket has been allocated. The table 10 2110 represents the ticket supply database 2030 before a transaction represented by a round-up amount 2130. The table 2120 represents the ticket supply database 2030 after the transaction represented by the round-up amount 2130. The round-up amount 2130 has a value of \$0.35, and corresponds to a transaction where a customer exchanges his change due (\$0.35) for a fractional lottery ticket. The customer thus obtains a portion of a lottery ticket, 15 and the portion is based on the monetary amount \$0.35.

As described above, each of the entries shown in the table 2110 corresponds to a ticket. Except for the entry 2135, the monetary amount \$0.35 is greater than the unallocated portions of every entry. By contrast, the entry 2135 has an unallocated portion of \$0.78, and thus a \$0.35 portion of the corresponding lottery ticket may be allocated therefrom.

20 Accordingly, the lottery ticket corresponding to the entry 2135 is selected, and a portion corresponding to \$0.35 is allocated to make a new fractional lottery ticket.

The entry 2135 represents the ticket "1234563" before the \$0.35 portion is allocated therefrom. An entry 2140 of the table 2120 represents the ticket "1234563" after the \$0.35 portion is allocated therefrom. The unallocated portion of the entry 2140 is \$0.43, which is

the original \$0.78 unallocated portion reduced by \$0.35. Similarly, before the transaction represented by the round-up amount 2130, the total remaining unallocated amount (of all lottery tickets) is \$1.54. After the transaction, the total remaining unallocated amount is \$1.19, which is \$1.54 reduced by \$0.35.

- 5 Referring to FIG. 34, the transaction database 2032 of FIG. 29 includes rows 2150, 2152, 2154, 2156 and 2158, each of which represents an entry of the transaction database 2032. Each entry defines a transaction initiated by a POS terminal. In particular, each entry includes (i) a transaction number 2160 that uniquely identifies the transaction; (ii) a POS terminal identifier 2162 that uniquely identifies the POS terminal initiating the transaction;
- 10 (iii) a purchase price 2164; (iv) a rounding multiple 2165 that is used to indicate an amount to which the purchase price is to be rounded; (v) a round-up amount 2166 that is the monetary amount used to purchase the fractional lottery ticket; (vi) an indication of whether the offer for a fractional lottery ticket was accepted 2168; (vii) a frequent shopper number 2170 identifying a customer who has used a frequent shopper card for the transaction; (viii)
- 15 a date 2172 of the transaction; and (ix) a fractional ticket identifier 2174 that identifies a fractional lottery ticket provided in exchange for the round-up amount.

The round-up amount 2166 is the monetary amount used to purchase the fractional lottery ticket. In some embodiments, round-up amount 2166 is equal to the allocated portion of a lottery ticket. For example, a customer may have \$0.62 in change (the round-up amount) from a purchase, and use that change to acquire a \$0.62 portion of a lottery ticket. However, the monetary amount used to purchase the fractional lottery ticket need not be equal to the allocated portion of the corresponding lottery ticket. In certain embodiments, the allocated portion of a lottery ticket is based on a rounded-down (or rounded-up) monetary amount. For example, a customer may have \$0.62 in change from a purchase, and

use that change to acquire a fractional lottery ticket. The fractional lottery ticket may be based on an allocated \$0.60 (\$0.62 rounded down to the nearest nickel) portion of a lottery ticket. Of course, the monetary amount may be rounded down to other multiples, such as to the nearest dime, quarter or dollar, and that rounded amount would define the allocated 5 portion of a lottery ticket. The difference between the change due and the rounded-down amount upon which the fractional lottery ticket is based may, for example, be kept as a service fee by the seller of the fractional lottery ticket.

The allocated portion of a lottery ticket may be based on the monetary amount in still further ways. For example, the allocated portion may be double the monetary amount. It 10 may be advantageous to provide such a double-value allocated portion if a customer buys a predetermined good or type of good, or if the customer uses a frequent shopper card. For example, if a customer has \$0.62 in change and purchases a product of a particular manufacturer, the customer receives a fractional lottery ticket that is based on an allocated \$1.24 (double \$0.62) portion of one or more lottery tickets in exchange for his change.

15 Referring to FIG. 35, tables 2180 and 2190 represent records of the fractional ticket database 2034 (FIG. 29). Typically, the fractional ticket database 2034 includes a plurality of records such as those represented by the table 2180 and 2190. Each record of the fractional ticket database 2034 defines a fractional lottery ticket, and each fractional lottery ticket includes allocated portions of one or more lottery tickets.

20 The record represented by the table 180 defines a fractional lottery ticket that is identified by an identifier 2185 (the identifier "1001"). The table 2180 includes an entry 2187, which defines a portion of a lottery ticket that is included in the fractional lottery ticket "1001". The entry 2187 includes (i) a ticket identifier 2182 that uniquely identifies

the lottery ticket; and (ii) a portion 2184 indicating a portion of the lottery ticket that is included in the fractional lottery ticket "1001".

Similarly, the record represented by the table 2190 defines a fractional lottery ticket that is identified by an identifier 2195 (the identifier "1003"). The table 2190 includes 5 entries 2197 and 2198, which each include (i) a ticket identifier 2192; and (ii) a portion 2194. Since the fractional lottery ticket "1003" includes portions from more than one lottery ticket, the fractional lottery ticket "1003" may include allocated amounts which collectively exceed the maximum price of one lottery ticket.

As described above, a fractional lottery ticket includes portions of one or more 10 lottery tickets. In certain embodiments, the lottery tickets are not chosen by the customer, but are instead chosen automatically by the POS terminal or store controller 2010 (FIG. 28). In such embodiments, a lottery ticket is selected from the plurality of lottery tickets in the ticket supply database 2030 (FIG. 29). The lottery ticket may be selected in several ways. For example, a lottery ticket having an unallocated portion at least as great as the monetary 15 value may be selected. Similarly, a set of lottery tickets that each have an unallocated portion at least as great as the monetary value may be determined. From this set, the lottery ticket which has a minimal unallocated portion is selected. The description below further clarifies this method of selecting a lottery ticket.

Referring to FIG. 36, a table 2200 illustrates exemplary data for the ticket supply 20 database 2030 (FIGS. 29 and 32). The table 2200 includes entries 2202, 2204, 2206 and 2208. A round-up amount 2220 has a value of \$0.60, and corresponds to a transaction where a customer exchanges his change due (\$0.60) for a fractional lottery ticket. The customer thus obtains a portion of a lottery ticket, and the portion is based on the monetary amount \$0.60. To select the lottery ticket from which to allocate a portion, the store

controller 2010 determines a set of tickets that each have an unallocated portion of at least \$0.60. This set includes the entries 2204, 2206 and 2208. From this set, the lottery ticket which has a minimal unallocated portion is selected. Of the entries 2204, 2206 and 2208, the entry 2208 has the minimal unallocated portion (\$0.61). Accordingly, the lottery ticket 5 corresponding to the entry 2208 is selected, and a \$0.60 portion is allocated therefrom.

In other embodiments, the customer may select the ticket numbers himself at the time of the transaction, either manually or through numbers stored on a frequent shopper card. One or more lottery tickets that include those ticket numbers would be acquired (e.g., by electronic request to the lottery server 2012), added to the ticket supply database 2030 10 (FIG. 29), and one or more portions thereof would be included in the fractional lottery ticket purchased by the customer. Such an embodiment allows a customer to obtain a fractional lottery ticket having his favorite or "lucky" numbers.

Once a fractional lottery ticket has been determined, the POS terminal prints for the customer a ticket indicative of the fractional lottery ticket, for example, on a receipt. The 15 printed ticket serves as proof that the customer is entitled to the indicated portions of any prizes won by the indicated lottery tickets. Such a printed ticket may include the corresponding (i) fractional lottery ticket identifier, (ii) ticket numbers, (iii) allocated portion(s) of the lottery ticket(s), (iv) transaction identifier, and (v) an encrypted code based on a combination thereof. Such an encrypted code may be used to verify that the printed 20 ticket is unaltered. Encryption techniques are described in "Applied Cryptography: Protocols, Algorithms and Source Code in C, Second Edition", by Bruce Schneier, published 1996. Those skilled in the art will understand that the encrypted code will be determined by a cryptographic algorithm such that it would be almost impossible for a forger to generate a valid code, much less a code that indicates a winning lottery ticket.

The printed ticket may also include contractual language, such as provisions assigning to the customer the right and title in and to the indicated portions of any prizes won by the indicated lottery tickets. Still further matter such as the drawing date and an expiration date of the fractional lottery ticket may be included on the printed ticket, as will 5 be understood by those skilled in the art. It may be further desirable to print a bar code that indicates any or all of the above information, thereby facilitating entry of the information using a bar code scanner.

Referring to FIG. 37, a method 2240 for allocating portions of lottery tickets initiates by determining a monetary value (step 2242). For example, a POS terminal may calculate 10 an amount of change due and round this amount down to the nearest dime. The POS terminal transmits the rounded amount to the store controller, and the store controller thereby determines the monetary value to be this rounded amount. The store controller in turn allocates a portion of a lottery ticket, the portion being based on the monetary value (step 2244). The store controller then outputs (i) a ticket identifier that identifies the lottery 15 ticket, and (ii) a portion identifier that identifies the allocated portion of the lottery ticket (step 2246). For example, the store controller typically transmits the ticket identifier and the portion identifier to the POS terminal, and the POS terminal in turn prints a fractional lottery ticket based on the transmitted identifiers, as described above. The store controller also stores the ticket identifier and the portion identifier (step 2248), for example, in the 20 fractional ticket database 2034 (FIG. 29), for authentication purposes.

#### Acquiring Additional Lottery Tickets

As described above, portions of lottery tickets from the supply of lottery tickets are allocated. After an allocation, it is possible that a lottery ticket will have an unallocated portion of \$0.00. In other words, the entire lottery ticket will have been allocated, and no further portions of the lottery ticket remain to be allocated.

- 5        In addition, after an allocation, it is possible that no single lottery ticket has an unallocated portion which is sufficient to satisfy a particular request (or an anticipated request) for a fractional lottery ticket. For example, there may be an attempt to allocate a \$0.35 portion of a lottery ticket, yet no lottery ticket represented in the ticket supply database 2030 (FIG. 29) has an unallocated portion of \$0.35 or more. In such a situation, it
- 10      may be possible to allocate portions from a plurality of lottery tickets, such that the portions collectively equal \$0.35. However, it may be desirable to allocate a portion from a single lottery ticket, rather than from many. For example, it is simpler for a customer to track one set of ticket numbers, rather than a plurality of sets of ticket numbers.

- Accordingly, it is advantageous to acquire additional lottery tickets for the supply of
- 15      lottery tickets. It is particularly advantageous to acquire additional lottery tickets at a time before the lottery tickets are needed, so as not to introduce undue delays into a transaction. Additional tickets may be acquired in predetermined amounts to reduce time spent acquiring lottery tickets. For example, thirty tickets may be acquired at once. In addition, the predetermined amount may depend on criteria such as the number of POS terminals in use.
- 20      Additional lottery tickets may be acquired by purchasing "quick pick" tickets (Tickets with randomly selected ticket numbers) from the state lottery in a known manner.

In one embodiment, the store controller 2010 (FIG. 28) counts the number of tickets that have an unallocated portion that is above a first predetermined threshold. For example, the store controller 2010 may count the number of tickets that have an unallocated portion

that is above \$0.50. This number is compared with a second predetermined threshold, and one or more additional lottery tickets are acquired if this number is below the second predetermined threshold. For example, if there are less than ten lottery tickets having unallocated portions above \$0.50, additional lottery tickets are acquired.

- 5 In another embodiment, the store controller 2010 (FIG. 28) counts the number of tickets that have an unallocated portion that is above a requested portion. For example, a POS terminal may request a \$0.40 fractional lottery ticket from the store controller. The store controller 2010 then counts the number of tickets that have an unallocated portion that is above \$0.40. This number is compared with a predetermined threshold, and one or more  
10 additional lottery tickets are acquired if this number is below the predetermined threshold. For example, if there are less than eight lottery tickets having unallocated portions above \$0.40, additional lottery tickets are acquired.

- In another embodiment, the store controller 2010 (FIG. 28) calculates the sum of the unallocated portions of all tickets. If the sum is below a predetermined threshold, additional  
15 tickets are acquired. For example, if the total remaining unallocated amount is below \$10.00, a block of thirty additional tickets are acquired.

#### Redeeming Portions of Lottery Tickets

- 20 The business or other entity acquiring and maintaining the supply of lottery tickets may check each to determine whether any are winning tickets. If so, the business preferably redeems the winning tickets for prizes as soon as practical, so that the prizes may be used to pay those customers that have corresponding fractional lottery tickets. Winning ticket numbers may be entered manually into the store controller 2010 (FIG. 28) when available.

Ideally, the store controller 10 will receive from the lottery server 2012 (FIG. 28) the winning ticket numbers for each drawing date. The store controller can store these winning ticket numbers in the winning lottery ticket database 2036 (FIG. 29).

Referring to FIG. 38, the winning lottery ticket database 2036 includes entries 2260, 5 2262 and 2264, each defining winning ticket numbers for a drawing date. Each entry includes (i) a corresponding drawing date 2266, (ii) winning ticket numbers 2268, and (iii) a prize 2270. The winning lottery ticket database 2036 should include entries for all drawing dates corresponding to valid and redeemable fractional lottery tickets. For example, if fractional lottery tickets may be redeemed up to one year after the corresponding drawing 10 date, then the entries for each drawing date of at least the past year should be stored. The prize 2270 may be, for example, the prize won upon matching all winning ticket numbers. More prizes may be specified for each entry. For example, a prize for matching only five of six winning ticket numbers may be specified for each entry as well.

When winning ticket numbers for a drawing date are received by the store controller 15 2010 (FIG. 28), the store controller 2010 may simply store them in the winning lottery ticket database 2036, where they are accessed when fractional lottery tickets are redeemed by customers. However, the store controller 2010 may also determine which fractional lottery tickets include portions of a winning lottery ticket. Then the corresponding records of the fractional ticket database 2034 (FIG. 29) may be modified to indicate that the fractional 20 lottery tickets include portions of winning lottery tickets. In addition, if those fractional lottery tickets were purchased using frequent shopper cards, then the corresponding customer may be notified.

Referring to FIG. 39, the frequent shopper database 2038 includes entries 2280, 2282, 2284 and 2286, each defining a frequent shopper (a customer who has used a frequent

shopper card for the transaction). In particular, each entry includes (i) a frequent shopper number 2288 for uniquely identifying the frequent shopper; (ii) an address 2290 of the frequent shopper; (iii) a telephone number 2292 of the frequent shopper; (iv) a name 2294 of the frequent shopper; and (v) an email address 2296 of the frequent shopper. With such stored information, frequent shoppers may be notified by mail, telephone call, email or other forms of notification as desired. In addition, frequent shoppers may be notified by the POS terminal when they next use their frequent shopper card. Providing frequent shopper with the additional benefit of notification is advantageous because it may prompt customers to become frequent shoppers. Consequently, these customers are more likely to continue frequenting the corresponding business.

To redeem a fractional lottery ticket, a customer preferably provides the printed ticket to show that he is entitled to the indicated share of the prize. The printed ticket is verified to assure that it is valid and unaltered. For example, if the printed ticket is valid, the fractional lottery ticket identifier inscribed on the printed ticket indicates a record in the fractional ticket database. That record should in turn indicate corresponding information on the printed ticket. In addition, the encrypted code can be verified.

Referring to FIG. 40, a method 2300 for redeeming a fractional lottery ticket initiates by receiving (i) a ticket identifier that identifies a lottery ticket, and (ii) a portion identifier that identifies an allocated portion of the lottery ticket (step 2302). Such identifiers may be received by manually entering one or more identifiers into a POS terminal, from which the identifiers are transmitted to the store controller 2010 (FIG. 28). Alternatively, a bar code scanner of the POS terminal may read a bar code on the printed ticket, and transmit the bar code to the store controller 2010. The entered identifier or bar code may be indicative of the fractional lottery ticket identifier, which may be used to retrieve a corresponding ticket

identifier and portion identifier from the fractional ticket database 2034 (FIG. 29). The store controller thus receives the ticket identifier and portion identifier.

Once the identifiers are received, thereby identifying one or more lottery tickets and allocated portions thereof, a prize value of the lottery tickets is determined (step 2304). As

- 5 discussed above, the prize value may be determined by comparing ticket numbers of a lottery ticket with winning ticket numbers stored in the winning lottery ticket database 2036 (FIG. 29). As also described above, the portion of the prize that is to be provided to the customer is determined by the allocated portion of the lottery ticket. This portion of the prize is provided to the customer (step 2306), typically by providing cash from a cash
- 10 register or by writing or printing a check made out to the customer.

A winning lottery ticket may have an unallocated portion greater than zero. Such a winning lottery ticket will have an associated portion of the prize value that is not to be paid to customers. This portion of the prize is instead retained by the business, and may be used to finance various customer incentives. For example, a portion of retained prize value may

- 15 be provided back to customers in the form of fractional lottery tickets (e.g., \$0.05 of change buys a \$0.50 fractional lottery ticket).

The business may retain further winnings by providing winning tickets with portions of certain prize values. For example, customers may only be provided with shares of "jackpot" prizes (e.g. matching all six winning ticket numbers). Any other prizes are

- 20 retained by the business. Of course, such restrictions would typically be explained to the customers through advertising and printed information on the fractional lottery ticket.

Although the present invention has been described with respect to a preferred embodiment thereof, those skilled in the art will note that various substitutions may be made to those embodiments described herein without departing from the spirit and scope of the

present invention. For example, the present invention is applicable to many types of games besides lotteries in which prizes are awarded. In addition, in some embodiments the data stored on the store controller may instead be stored among the POS terminals. Similarly, some of the functions performed by the store controller may be performed by the POS

5 terminal, and vice versa.

A method an apparatus are provided whereby an upsell to offer to a customer is determined from the items in his purchase, according to predefined relationships. Such relationships between items in a purchase and upsells to offer may be described conceptually by a table that includes both the items and the upsells. The table, in turn, describes a corresponding

10 database defining upsells to offer when a customer's purchase consists of particular items.

Such a table-based embodiment is particularly easy for a typical store manager to understand. For example, a store manager of a fast-food restaurant might desire to see what upsells can be offered to a customer that orders a hamburger and small French fries. The store manager may search the table for entries that correspond to a hamburger and small

15 French fries, and then determines corresponding upsells from those entries.

Such a table-based embodiment is also easy for a typical store manager to adjust as necessary. For example, a store manager might determine that a significant number of customers who order a hamburger and small French fries would also find a dessert appealing. The store manager could then adjust the table (which represents a database) to

20 include an entry which defines a dessert upsell for purchases that consist of a hamburger and small French fries.

Since upsells are exchanged for spare change due, not all customers pay the same price for the same upsell. For example, if a customer has a first purchase price of \$4.64, a particular upsell may be offered in exchange for payment of a rounded price that is \$5.00

(\$4.64 rounded to the nearest dollar). The customer would thus pay \$0.36 for the upsell. However, another customer with a second purchase price of \$4.72 may be offered the same upsell for \$5.00 (\$4.72 rounded to the nearest dollar). Thus, this customer would pay \$0.28 for the same upsell. Accordingly, the upsell is not a product that is merely on-sale and has a fixed price for every customer. Instead, the upsell is purchased for an amount that may be different for every customer: an amount necessary to round the purchase price to some rounding multiple.

Referring to FIG. 41, a POS terminal 3010 comprises a processor 3012, such as one or more conventional microprocessors. The processor 3012 is in communication with a data storage device 3014, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 3012 and the storage device 3014 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination thereof. For example, the POS terminal 10 may comprise one or more computers that are connected to a remote server computer for maintaining databases.

An input device 3016, a printer 3018 and a display device 3020 are each in communication with the processor 3012. The input device 3016 preferably comprises a keypad for transmitting input signals, such as signals representative of a purchase, to the processor 20 3012. The input device 3016 may also comprise an optical bar code scanner for reading bar codes and transmitting signals representative of those bar codes to the processor 3012. The printer 3018 is for registering indicia on paper or other material, thereby printing receipts as commanded by the processor 3012. The display device 3020 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or a

cashier operating the POS terminal 3010. Many types of input devices, printers and display devices are known to those skilled in the art, and need not be described in detail herein.

The storage device 3014 stores a program 3022 for controlling the processor 3012.

The processor 3012 performs instructions of the program 3022, and thereby operates in

- 5 accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 3022 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 3012 to interface with computer peripheral devices, such as the input device 3016, the printer 3018 and the display device 3020. Appropriate device drivers and other
- 10 necessary program elements are known to those skilled in the art, and need not be described in detail herein.

The storage device 3014 also stores (i) an inventory database 3024; (ii) a possible upsells database 3026; (iii) an upsell offer database 3028; and (iv) an accepted offer database 3030. The databases 3024, 3026, 3028 and 3030 are described in detail below and

- 15 depicted with exemplary entries in the accompanying figures. As will be understood by those skilled in the art, the schematic illustrations of, and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides the tables shown. Similarly, the illustrated entries represent exemplary information, but those skilled in the art
- 20 will understand that the number and content of the entries can be different from those illustrated herein.

Referring to FIG. 42, another embodiment of a POS terminal 3040 includes a control device 3042 which is in communication via a communication medium 3044 with a system 3046 for printing receipts and/or coupons. The control device 3042 comprises a processor

3048 that is in communication with the input device 3016 (FIG. 41) and the display device 3020 (FIG. 41). The system 3046 for printing comprises a processor 3050 in communication with the storage device 3014 (FIG. 41) and the printer 3018 (FIG. 41). In this embodiment, the control device 3042 may be a cash register, and the system 3046 may 5 be an electronic device for printing coupons in accordance with data received from the cash register. Other configurations of POS terminals will be understood by those skilled in the art.

- Referring to FIG. 43, the inventory database 3024 of FIG. 41 includes entries 3100, 3102, 3104, 3106, 3108, 3110, 3112 and 3114, each defining an item which may be 10 purchased. Each entry includes (i) an item identifier 3116 that uniquely identifies the item; (ii) an item description 3118; (iii) an item price 3120; and (iv) an item cost 3122. For each entry, the item price 3120 indicates a price that a customer normally pays for the corresponding item, and the item cost 3122 indicates a cost of the item to the business. Accordingly, the item cost 3122 may be, for example, a price that the business itself pays for 15 the item. In some embodiments, the inventory database 3024 may also include an indication of the quantity available of each item.

- Referring to FIG. 44, the possible upsells database 3026 of FIG. 41 includes entries 3140, 3142, 3144 and 3146, each defining an upsell that may be offered to a customer in exchange for change due. Each entry includes (i) an upsell identifier 3148 that uniquely 20 identifies the upsell; and (ii) an upsell description 3150.

Referring to FIG. 45, a table 3155 illustrates one embodiment of the upsell offer database 3028 (FIG. 41). The table 3155 includes entries 3160, 3162, 3164, 3166, 3168 and 3170, each defining upsells to offer when a customer's purchase consists of particular items. Each entry includes (i) items 3172 included in the purchase; and (ii) upsells 3174 to offer.

For example, if a purchase consists of small French fries and a large cola, then the entry 3164 indicates that the upsell "D" is to be offered. As illustrated by the entry 3146 of the possible upsells database 3026 (FIG. 44), the upsell "D" is an upgrade from small French fries to large French fries. Accordingly, if the customer accepted this offer, he would

5 receive large French fries and a large cola.

The items included in a particular purchase may correspond to more than one entry of the upsell offer database 3028. For example, a purchase that consists of a hamburger and small French fries corresponds to the entry 3160 and to the entry 3162. If a purchase corresponds to more than one entry, then one entry may be selected at random, or in

10 accordance with direction from a cashier, and the upsell(s) corresponding to this entry are offered to the customer. Alternatively, the customer may be allowed to select from amongst the entries, and thereby choose the upsell(s) corresponding to the selected entry.

An entry of the upsell offer database 3028 may indicate more than one upsell. For example, the entry 3166 indicates that a customer purchasing a hamburger, large cola and

15 small French fries is offered upsells "C" and "D". Similarly, the entry 3168 indicates that a customer purchasing a hamburger, a large cola and medium French fries is offered upsells "C" and "C" (two units of upsell "C"). As indicated by the entry 3144 of the possible upsells database 3026 (FIG. 44), the upsell "C" is an apple pie. Accordingly, if the customer accepted this offer, he would receive a hamburger, a large cola, medium French fries and

20 two apple pies.

A rounded price that the customer pays for both the items and the upsell(s) may be determined by rounding up the purchase price to a predetermined multiple, such as to the next higher dollar amount. Alternatively, the upsell offer database 3028 may indicate the rounded price, directly or indirectly, as described below.

Referring to FIG. 46, a table 3180 illustrates another embodiment of the upsell offer database 3028 (FIG. 45). The table 3180 includes entries 3190, 3192, 3194, 3196, 3198 and 3200, each defining upsells to offer when a customer's purchase consists of particular items. Each entry includes (i) items included in the purchase 3202; (ii) upsells 3204 to offer; and

5 (iii) a rounded price 3206 to charge for the items and the upsells if the customer accepts the offer. For example, if a purchase consists of a hamburger, a large cola and large French fries, and upsell "C" is offered and accepted in accordance with the entry 3200, then the entry 3200 also indicates that a rounded price of \$5.00 is charged to the customer. Although the exemplary rounded prices depicted in FIG. 46 are each multiples of one dollar, the

10 rounded prices may be multiples of any value, such as five dollars or twenty-five cents.

Referring to FIG. 47, a table 3220 illustrates another embodiment of the upsell offer database 3028 (FIG. 45). The table 3220 includes entries 3222, 3224, 3226, 3228, 3230 and 3232, each defining upsells to offer when a customer's purchase consists of particular items. Each entry includes (i) items included in the purchase 3234; (ii) upsells 3236 to offer; and

15 (iii) an upsell price 3238 to be added to the purchase price if the customer accepts the offer. Preferably, the upsell prices are such that, when added to the corresponding purchase price, the resulting sum is a rounded price, such as a multiple of a dollar.

Referring to FIG. 48, a table 3250 illustrates another embodiment of the upsell offer database 3028 (FIG. 45). The table 3250 includes entries 3252, 3254, 3256, 3258, 3260 and 20 3262, each defining upsells to offer when a customer's purchase consists of particular items. Each entry includes (i) items included in the purchase 3264; (ii) upsells 3266 to offer; and (iii) a rounding multiple 3268 that indicates an amount to which the purchase price is rounded if the customer accepts the offer. Thus, the purchase price would be determined, and then rounded in accordance with the corresponding rounding multiple to yield a rounded

price. For example, the entries 3252, 3254, 3256, 3258, 3260 and 3262 each define that the purchase price is rounded to the nearest dollar.

Referring to FIG. 49, a method 3280 for providing a supplementary product sale at a POS terminal initiates when the POS terminal receives the items in a purchase (step 3282).

- 5 Typically, each item will have a bar code that is scanned by a bar code scanner, and the POS terminal in turn receives, from the bar code scanner, signals representative of the items. Alternatively, various keys of the input device 3016 may be pressed to generate signals representative of the items. The POS terminal then determines an upsell based on the items (step 3284). To determine the upsell, the POS terminal may search the upsell offer database 10 3028 (FIG. 41) in order to determine one or more records that correspond to the items, and thereby determine the corresponding upsells of those records.

The POS terminal determines a rounded price that the customer may pay for both the items and the upsell(s) (step 3286). As described above, the rounded price may be

determined by rounding up the purchase price to a predetermined multiple, such as to the

- 15 next higher dollar amount. In other embodiments, the rounded price is determined from the upsell offer database. In one embodiment, the rounded price may be determined based on a record of the upsell offer database. For example, as described above with respect to FIG. 46, each entry of the upsell offer database may include the rounded price. In another embodiment, as described above with respect to FIG. 47, each entry of the upsell offer 20 database may include a rounding multiple, and the purchase price is rounded in accordance with the rounding multiple to thereby generate the rounded price. In still another embodiment, as described above with respect to FIG. 48, each entry of the upsell offer database may include an upsell price that is added to the purchase price to thereby generate the rounded price.

The customer is provided with an offer to exchange (purchase) the items and the upsell(s) for the rounded price (step 3288). For example, the POS terminal may output an indication of the upsell(s), such as the name of the upsell(s), on the display device 3020 (FIG. 41). If the customer accepts the offer, a required payment amount is set to be the  
5 rounded price. This required payment amount is an amount of money expected to be paid in return for products provided to the customer. From the required payment amount, the processor 3012 (FIG. 41) may determine, for example, the total amount of money that should have been collected by the POS terminal at the end of a day. Those skilled in the art will note that the required payment amount is typically stored on the data storage device  
10 3014, and may comprise, for example, a single stored value for the transaction or a plurality of values which each correspond to an amount of money expected to be paid for one or more products in the transaction.

The customer responds to the offer, and the response is received by the POS terminal when a key on the input device 3016 is pressed, or in other manners known to those skilled  
15 in the art (step 3290). If the response indicates acceptance of the offer, the items and the upsell(s) are exchanged for the rounded price (step 3292). If desired, the POS terminal makes appropriate adjustments to stored indications of available quantities of items to reflect that the items and upsell(s) have been sold. The POS terminal may also store the response to the offer for accounting and marketing analysis.

20 Applicants have recognized that supplementary processes performed by POS terminals may introduce delays in the completion of customer transactions, and that these delays may be acceptable under certain circumstances. For example, when there are few pending customer transactions, such delays do not significantly affect relevant measures of performance such as sales per hour or profit per hour.

Accordingly, performing supplementary processes during periods of low activity, yet reducing or refraining from supplementary processes during periods of high activity, can result in increased profit. Such increased profit can exceed the profit of POS terminals that either always perform the supplemental process or never perform the supplemental process.

- 5 In one embodiment of the present invention, a POS terminal measures one or more criteria, such as an activity rate of a terminal, and performs a supplementary process if the criteria are less than predetermined thresholds. In another embodiment, a POS terminal measures an activity rate of a terminal, determines an offer schedule in accordance with the activity rate, and in turn provides a supplementary product offer in accordance with the offer
- 10 schedule. The offer schedule may specify that time-consuming offers (offers with a low "offer speed") are made during periods of low terminal activity, while quicker offers (offers with a high "offer speed") are made during periods of higher terminal activity.

It is particularly desirable to provide an offer to exchange spare change due for an upsell, as described in the aforementioned parent application, Application No. 08/920,116.

- 15 Accordingly, the present invention contemplates providing offers for upsells having high performance rates. In addition, the present invention contemplates providing offers for different upsells in accordance with an offer schedule.

Referring to FIG. 50, a POS terminal 4010, which may be the IBM "4683" or IBM "4693" manufactured by International Business Machines, comprises a processor 4012, such as one or more conventional microprocessors. The processor 4012 is in communication with a data storage device 4014, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 4012 and the storage device 4014 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or 25 radio frequency transceiver; or (iii) a combination thereof. For example, the POS terminal 4010 may comprise one or more computers which are connected to a remote server computer for maintaining databases.

An input device 4016 preferably comprises a keypad for transmitting input signals, such as signals indicative of a purchase, to the processor 4012. A printer 4018 is for 30 registering indicia on paper or other material, thereby printing receipts, coupons and vouchers as commanded by the processor 4012. A display device 4020 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or cashier.

Many types of input devices, printers and display devices are known to those skilled in the art, and need not be described in detail herein. The input device 4016, printer 4018 and display device 4020 are each in communication with the processor 4012.

- A sensor 4022 is also in communication with the processor 4012. The sensor 4022  
5 and processor 4012 may be used to measure, for example, the number of customers entering  
a store or the number of customers in the vicinity of the POS terminal 4010. Many other  
types of sensors are known and need not be described in detail herein.

The storage device 4014 stores a program 4024 for controlling the processor 4012.  
The processor 4012 performs instructions of the program 4024, and thereby operates in  
10 accordance with the present invention, and particularly in accordance with the methods  
described in detail herein. The program 4024 furthermore includes program elements that  
may be necessary, such as an operating system and "device drivers" for allowing the  
processor to interface with computer peripheral devices, such as the input device 4016, the  
processor 4018, the display device 4020 and the sensor 4022. Appropriate device drivers and  
15 other necessary program elements are known to those skilled in the art, and need not be  
described in detail herein.

FIG. 51 illustrates another embodiment of the POS terminal 10 of FIG. 50, in which  
a control device 4028 is in communication via a communication medium 4030 with a  
system 4032 for providing a supplementary process. The control device 4028 comprises a  
20 processor 4034 in communication with the input device 4016 and the display device 4020.  
The system 4032 for providing a supplementary process comprises a processor 4036 in  
communication with the storage device 4014, the printer 4018 and the sensor 4022. In this  
embodiment, the control device 4028 may be a cash register, and the system 4032 may be an  
electronic device connected thereto for printing coupons in accordance with data received  
25 from the cash register. Other configurations of the POS terminal 4010 will be understood  
by those skilled in the art.

Referring to FIG. 52, a method 4040 for controlling the performance of a  
supplementary process initiates with the POS terminal 4010 of FIG. 50 and FIG. 51  
measuring one or more criteria, such as the activity rate of the POS terminal 4010 (step  
30 4042). For example, the POS terminal 4010 may measure the number of completed  
transactions per time (transaction rate), the number of items purchased through the POS  
terminal 10 per period of time (item sale rate), or the number of upsells accepted by

customers per period of time (upsell acceptance rate). The POS terminal 4010 may measure the number of customers, such as the number of customers in a store or the number of customers in the vicinity of the POS terminal 4010, through input signals received from the sensor 4022. Many other types of measurements may be made by the POS terminal 4010.

- 5        The POS terminal 4010 then determines, based on the measured activity rate or other criteria, whether to perform a supplementary process, such as offering an upsell in exchange for change due. In one embodiment, the POS terminal 4010 compares the activity rate to a predetermined threshold. Such a threshold may be determined (step 4044) in a number of ways. For example, the threshold may be a predetermined value (e.g. a rate of three  
10 transactions per minute), or a variable value (e.g., three transactions per minute after 5:00 PM, two transactions per minute otherwise). Many methods of calculating thresholds, based on many variables such as time of day and day of the week, will be understood by those skilled in the art.

Once the threshold is determined, the activity rate is compared to the predetermined  
15 threshold (step 4046). One comparison is to determine whether the activity rate is less than the threshold. For example, the POS terminal 4010 may determine whether the measured number of completed transactions in the last ten minutes is less than a predetermined threshold of seven transactions per ten minute period.

- If the comparison is valid, (e.g., the measured activity rate is less than the threshold),  
20 then the POS terminal 4010 performs the supplementary process (step 4048). The POS terminal 4010 may perform the supplementary process by executing instructions of the program 4024 (FIG. 50). Alternatively, the POS terminal 4010 may perform the supplementary process by sending control signals from the control device 4028 (FIG. 51) to the system 4032 for providing a supplementary process. In such an embodiment, the control  
25 device 4028 determines whether to enable or disable the system 4032. For example, the control device 4028 may disable the system 4032 if the activity rate is greater than a predetermined threshold, and enable the system 4032 if the activity rate is less than the predetermined threshold. The control device 4028 may enable and disable the system 4032 by transmitting thereto appropriate enable signals and disable signals. Such signals may be  
30 control signals, which serve only to enable or disable the performance of the supplementary process, or may be data signals, which contain additional information for use by the system 4032. Instead of separate enable and disable signals, the control device 4028 may transmit

to the system 4032 a signal that toggles the system 4032 between an enabled mode and a disabled mode.

It will be understood by those skilled in the art that the system 4032 may alternatively be "enabled-until-disabled". In other words, the control device 4028 would 5 only need to transmit a disable signal when the supplementary process is not to be performed. When no disable signal is transmitted to the system 4032, the system 4032 would perform the supplementary process (even if no enable signal is received). Similarly, the system 4032 may be "disabled-until-enabled". In other words, the control device 4028 would only need to transmit an enable signal when the supplementary process is to be 10 performed. When no enable signal is transmitted to the system 4032, the system 4032 would not perform the supplementary process (even if no disable signal is received).

As an illustration of the above-described method 4040, the POS terminal may measure an activity rate, and determine if the activity rate is less than a predetermined threshold. If so, the POS terminal then determines an upsell in dependence on a purchase, 15 as described in a parent application of the present application, Patent Application No. 08/920,116, entitled METHOD AND SYSTEM FOR PROCESSING SUPPLEMENTARY PRODUCT SALES AT A POINT-OF-SALE TERMINAL, filed on August 26, 1997. The POS terminal further determines an upsell price in dependence on the purchase, and offers the customer an upsell in exchange for the upsell price.

20 In the above-described embodiments, the POS terminal 4010 determines whether a supplementary process is or is not performed. In other embodiments, the POS terminal 4010 may further select a supplementary process based on the measured activity rate or other criteria. For example, it may be desirable that different types of offers are provided to customers depending on the activity rate of the POS terminal. In particular, more time-consuming offers are provided when the measured activity rate is low, while quicker offers 25 are provided when the measured activity rate is high.

FIG. 53 is a table 4060 that illustrates an offer schedule, which may be implemented as a database stored on the storage device 4014 in a manner well known in the art. Each row of the table 4060 represents an entry, and each entry defines an upsell to offer for an activity 30 rate. In particular, each entry includes an activity rate identifier 4062 that uniquely identifies the entry, an activity rate 4064 which describes a rate or range of rates, and an upsell to offer 4066 at that activity rate. As described in Patent Application No. 08/920,116,

the upsell to offer 4066 may include two or more upsells which are offered one at a time until an upsell is accepted.

An entry 4068, corresponding to activity rates less than eight transactions per fifteen-minute period, indicates that an additional product is to be offered during these (relatively low) activity rates. Additional product offers typically have low "offer speeds", since it may be several seconds for a cashier to retrieve the additional product if the offer is accepted by the customer. An entry 4070, corresponding to activity rates between eight and fifteen transactions per fifteen-minute period, indicates that a "triple-your-change" coupon is to be offered during these activity rates. Typically, printing a coupon is quicker than offering an additional product. A coupon offer thus has a higher offer speed, which is why a coupon is to be offered during periods of higher terminal activity. An entry 4072 indicates that no offer is to be provided at activity rates greater than fifteen transactions per fifteen-minute period.

The above embodiments describe how the POS terminal automatically controls the performance of a supplementary process. It may further be desirable to provide a method and apparatus to, at times, counteract such automatic control. Allowing a manual override of the decision of the POS terminal would provide even finer control over the performance of the supplementary process. For example, a store manager may wish to test the supplementary process, even though the POS terminal is not currently performing the supplementary process. In addition, there may be certain situations, which a device cannot accurately account for, in which a supplementary process should not be performed.

Referring to FIG. 54, an apparatus 4080 includes an override decision manager 4082 which receives input from an override signal circuit 4084 and from an automatic control signal circuit 4086. The override signal circuit 4084 is a device that provides an override signal, such as a switch in communication with the POS terminal. The override signal circuit 4084 may be one or more keys on the input device 4016 (FIG. 50 and FIG. 51), or may be another device that transmits and/or generates signals. The automatic control signal circuit 4086 is the portion of the POS terminal that provides the control signal for controlling automatic performance of the supplementary process, as described above. The override decision manager 4082 receives the override signal and control signal from circuits 4084 and 4086, respectively, and generates in dependence thereon an "enhanced control" signal for controlling performance of the supplementary process. The enhanced control

signal is transmitted to a system 4088 for performing a supplementary process. The system 4088 may be a software module which is a component of the POS terminal 4010 of FIG. 50, or may be the system 4032 for providing a supplementary process of FIG. 51.

The override signal may be used to counteract the performance of the supplementary

- 5 process that would have otherwise occurred in accordance with the control signal from the automatic control signal circuit 4086. Referring to Table 1 below, the Truth Table shown describes the output (Enhanced Control Signal) as a function of the inputs (Override Signal and Control Signal). Table 1 describes an embodiment where the override signal may attain one of two values (i.e., 0 or 1). However, those skilled in the art will understand that the  
10 override signal may attain more than two values.

Override Signal	Control Signal	Enhanced Control Signal
0	0	0
0	1	1
1	0	0
1	1	0

where:

Override Signal = 0 for Allowing Automatic Control

- 15 Override Signal = 1 for Disabling the Supplemental Process

Control Signal = 0 for Disabling the Supplemental Process

Control Signal = 1 for Enabling the Supplemental Process

- 20 Enhanced Control Signal = 0 for Disabling the Supplemental Process  
Enhanced Control Signal = 1 for Enabling the Supplemental Process

TABLE 1 – Truth Table for Override Decision Manager

For example, when Override Signal = 1 and Control Signal = 1, then a user is overriding the automatic determination to enable the supplemental process. Accordingly, the Enhanced Control Signal = 0, and the supplemental process is disabled.

Referring to FIG. 55, a network 4100 includes a server computer 4102 in

- 5 communication with POS terminals 4104, 4106 and 4108. The server computer 4102 may itself be a POS terminal, as described above. Although three POS terminals are shown in FIG. 55, any number of POS terminals may be in communication with the server computer 4102 without departing from the spirit and scope of the present invention. The server computer 4102 may perform many of the above-described processes, especially those
- 10 processes which are performed for more than one POS terminal. For example, the server computer 4102 may (i) measure the activity rate of any or all of the POS terminals 4104, 4106 and 4108, (ii) determine whether to provide a supplementary process at any or all of the POS terminals 4104, 4106 and 4108, (iii) enable or disable one or more systems for providing a supplementary process, and/or (iv) transmit an override signal to any or all of
- 15 the POS terminals 4104, 4106 and 4108. The server computer 4102 may also collect data from the POS terminals 4104, 4106 and 4108, thereby aggregating information about the processes that each POS terminal performs. For example, each POS terminal may measure its own activity rate, and transmit to the server computer 4102 signals indicative of the measured activity rate. The server computer 4102 may then determine an overall activity
- 20 rate for the network 4100 of POS terminals.

The measured activity rate may be, for example, the number of POS terminals in use (processing transactions) or the percentage of POS terminals in use. Based on the activity rate, the server computer 4102 may determine whether to permit the supplementary process to be performed at each POS terminal. Alternatively, the server computer 4102 may

- 25 determine which of the POS terminals are to perform the supplementary process.

FIG. 56 shows a table 4120 that illustrates an offer schedule for a network of POS terminals. Each row of the table 4120 represents an entry, and each entry defines an upsell to offer for an activity rate. The activity rate used in the table 4120 is based on which of a plurality of terminals are in use. Each entry includes an activity rate identifier 4122 that

- 30 uniquely identifies the entry, an activity rate 4124 which describes a rate or range of rates, and an upsell to offer 4126 at that activity rate. For example, the entry 4128, corresponding to less than 50% of all POS terminals in use, indicates that three products are to be offered,

and the customer is to choose one. The entries 4130, 4132 and 4134 similarly describe upsells to be offered for different activity rates. As described above, more time-consuming upsells such as multiple upsells offered one after the other may be offered during periods of lower activity.

- 5 The present invention allows a customer to select an upsell before a purchase is processed at a POS terminal. Thus, the customer need not be offered a system-selected upsell at the POS terminal that may be rejected. The present invention thus may save time at the POS terminal. The selected upsell also indicates an amount to which the purchase price should be rounded, saving even more time.

- 10 If a business has old or aging inventory, it may be advantageous to allow that inventory to be selected as an upsell in exchange for change due. Customers would act to clear the inventory, and thereby eliminate the costs of otherwise disposing of the inventory.

Referring to FIG. 57, a POS terminal 5010, which may be the IBM "4683" or IBM "4693" manufactured by International Business Machines, comprises a processor 5012, such

- 15 as one or more conventional microprocessors. The processor 5012 is in communication with a data storage device 5014, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 5012 and the storage device 5014 may each be (i) located entirely within a single computer or other computing device; (ii) connected to each other by a remote communication medium, such as a serial port cable, telephone line or  
20 radio frequency transceiver; or (iii) a combination thereof. For example, the POS terminal 5010 may comprise one or more computers which are connected to a remote server computer for maintaining databases.

An input device 5016 preferably comprises a keypad for transmitting input signals, such as signals indicative of a purchase, to the processor 5012. The input device 5016 may

- 25 also comprise an optical bar code scanner for reading bar codes and transmitting signals

indicative of those bar codes to the processor 5012. A printer 5018 is for registering indicia on paper or other material, thereby printing receipts, coupons and vouchers as controlled by the processor 5012. A display device 5020 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or cashier. Many types of input devices, 5 printers and display devices are known to those skilled in the art, and need not be described in detail herein. The input device 5016, printer 5018 and display device 5020 are each in communication with the processor 5012.

The storage device 5014 stores a program 5022 for controlling the processor 5012.

The processor 5012 performs instructions of the program 5022, and thereby operates in 10 accordance with the present invention, and particularly in accordance with the methods described in detail herein. The program 5022 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 5012 to interface with computer peripheral devices, such as the input device 5016, the printer 5018 and the display device 5020. Appropriate device drivers and other 15 necessary program elements are known to those skilled in the art, and need not be described in detail herein.

The storage device 5014 also stores (i) inventory database 5024; (ii) rounding code database 5026; and (iii) transaction database 5028. The databases 5024, 5026 and 5028 are described in detail below and depicted with exemplary entries in the accompanying figures.

20 As will be understood by those skilled in the art, the schematic illustrations and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides the tables shown. Similarly, the illustrated entries represent exemplary

information, but those skilled in the art will understand that the number and content of the entries can be different from those illustrated herein.

FIG. 58 illustrates another embodiment of the POS terminal 5010, in which a control device 5029 is in communication via a communication medium 5030 with a system 5032 for providing an offer for an upsell. The control device 5029 comprises a processor 5034 in communication with the input device 5016 and the display device 5020. The system 5032 for providing an offer comprises a processor 5036 in communication with the storage device 5014 and the printer 5018. In this embodiment, the control device 5029 may be a cash register, and the system 5032 may be an electronic device for printing coupons in accordance with data received from the cash register. Other configurations of the POS terminal 5010 will be understood by those skilled in the art.

Referring to FIG. 59, a network 5040 includes a server 5042 in communication with POS terminals 5044, 5046 and 5048. The server 5042 directs the operation of, stores data from and transmits data to the POS terminals 5044, 5046 and 5048. The server 5042 may 15 itself be a POS terminal, as described above, or may be another computing device that can communicate with one or more POS terminals. Although three POS terminals are shown in FIG. 59, any number of POS terminals may be in communication with the server 5042 without departing from the spirit and scope of the present invention. Each of the POS terminals 5044, 5046 and 5048 may be located in the same store, in different stores of a 20 chain of stores, or in other locations. The server 5042 may perform many of the processes described below, especially those processes that are performed for more than one POS terminal. The server 5042 may furthermore store data, such as the inventory database 5024 (FIG. 57), that is to be shared by the POS terminals 5044, 5046 and 5048.

Referring to FIG. 60, the inventory database 5024 includes rows 5032, 5033, 5034, 5035, 5036, 5037 and 5038, each of which represents an entry of the inventory database 5024. Each entry defines an item of inventory that may be sold. In particular, each entry includes (i) an item identifier 5040 that uniquely identifies the entry; (ii) a description 5042 5 that describes the item of inventory; (iii) a price 5044 of the item; and (iv) an taxable status 5046 that indicates whether the item is subject to sales tax (or other tax). The inventory database 5024 is accessed to determine a purchase price in a manner known in the art. For example, each item of a purchase may include a bar code that can be read by a POS terminal. The price of each item, corresponding to the bar code identifier, would in turn be 10 determined from the inventory database 5024. The sum of the item prices and any appropriate taxes applied thereto would yield the purchase price.

Referring to FIG. 61, the rounding code database 5026 includes rows 5050, 5052 and 5054, each of which represents an entry of the rounding code database 5026. Each entry defines a rounding code. In particular, each entry includes (i) a rounding code identifier 15 5056 that uniquely identifies the entry; (ii) a rounding multiple 5058 that indicates an amount to which a purchase price is to be rounded; and (iii) a fixed value 5060 that indicates a fixed price to pay for the corresponding upsell, if the upsell is not purchased for an amount of change due. For example, a rounding code corresponding to the entry 5050, identified by "567", has a rounding multiple of \$1. Thus, if a purchase includes an upsell having the 20 rounding code "567", the corresponding purchase price will be rounded to next higher dollar amount (e.g. from \$7.38 to \$8.00). It can be advantageous, and simpler for customers, to set the rounding multiple of each upsell equal to the fixed price of that upsell.

The upsells are accessible to customers, allowing customers to select the upsells as they select the items of their purchase. Each upsell has a rounding code which may be

determinable from a bar code printed on an adhesive label that is affixed to the upsell. For example, in a bookstore, there may a set of bins located near the POS terminals. Each bin holds several books, each having a bar code. The customer selects a book from a bin, and brings it to the POS terminal with the items he wishes to purchase. An optical bar code

- 5 scanner of the POS terminal reads the bar code of the book, and the bar codes of the items of the purchase.

Instead of a bar code, each upsell may include another indication of the corresponding rounding code. For example, each book in a first bin may be affixed with a green adhesive label, and each book in a second bin may be affixed with a blue adhesive  
10 label. In such an embodiment, the green adhesive label would indicate a first rounding code, and the blue adhesive label would indicate a second rounding code. A cashier or other operator of the POS terminal would in turn press a button or otherwise allow the POS terminal to receive data indicating the rounding code.

- It can be advantageous for upsells having the same rounding code to be grouped  
15 together. For example, a first bin could contain a number of books that each have a first rounding code. A second bin could contain a number of books that each have a second rounding code. If any book from the first bin is selected as an upsell, the purchase price would be rounded to a first multiple (e.g. the nearest \$5). Similarly, selecting any book from the second bin would cause the purchase price to be rounded to a second multiple (e.g.  
20 the nearest \$10).

Referring to FIG. 62, the inventory database 5024 and the rounding code database 5026 are used in determining an amount of money due as payment for items of a purchase and an upsell. Tables 5080 and 5082 each represent data corresponding to a transaction identified by a transaction identifier "12345678". Accordingly, the tables 5080 and 5082

represent data stored in the transaction database 5028 (FIG. 57). Typically, the transaction database 28 will include data representing a plurality of such transactions.

The table 5080 represents one or more items included in the transaction, and the table 5082 represents one or more upsells included in the transaction. The table 5080

- 5 includes entries 5084 and 5086, each defining a type of item to purchase. Each entry includes (i) an item identifier 5088; corresponding to the item identifier 5040 of FIG. 60; (ii) a quantity 5090 of the item; (iii) a price 5092 of each unit of the item, the price corresponding to the price 5044 of FIG. 60; and (iv) a price with tax 5094 of each unit of the item. The price with tax of an item may be determined from the corresponding price 5092,
- 10 the taxable status 5046 of FIG. 60 (which indicates whether the item is subject to sales tax or other tax), and a tax rate 5096. Those skilled in the art will readily understand that the tax rate 5096 may be, for example, stored on the storage device 5014 (FIG. 57) as a database or as a variable of the program 5024. The price with tax of each item is summed to yield a subtotal price with tax 5098. The subtotal price with tax 5098 is a price that would be due if
- 15 no upsell is included in the transaction.

The table 5082 includes an entry 5100 that defines an upsell included in the

- transaction. The entry 5100 includes (i) a rounding code identifier 5102, corresponding to the rounding code identifier 5056 of FIG. 61; (ii) a rounding multiple 5104, corresponding to the rounding multiple 5058 of FIG. 61; and (iii) a fixed value 5106, corresponding to the
- 20 fixed value 5060 of FIG. 61. The rounding multiple of the entry 5100 has the value \$5, indicating that the subtotal price with tax 5098 is to be rounded to the next higher multiple of \$5. Accordingly, the subtotal price with tax 5098, which has the value \$26.20, is rounded to the next higher multiple of \$5, yielding a rounded price 5108 having the value \$30.

FIG. 63 depicts a table 5120 that represents further information relating to transactions. Such information may be stored in the transaction database 5028 (FIG. 57) in certain embodiments of the present invention. The table 5120 includes entries 5122 and 5124, each defining further information relating to a transaction. Each entry includes (i) a 5 transaction identifier 5126 that uniquely identifies the transaction; (ii) a date 5128 on which the transaction occurred; (iii) a time 5130 at which the transaction occurred; (iv) a POS terminal identifier 5132 that indicates the POS terminal at which the transaction occurred; and (v) a revenue 5134 that was derived from the transaction. Information represented by the table 5120 may be used, for example, in determining patterns in revenue generation over 10 time.

FIG. 64 illustrates a method 5150 in which the above-mentioned databases are used in determining a rounded price for a purchase that includes an upsell and one or more items. A POS terminal receives a code for each item in the purchase (step 5152). For example, a bar code scanner reads a bar code imprinted on each item and generates signals indicative of 15 the bar code. The POS terminal also receives a rounding code for an upsell (step 5154). Those skilled in the art will understand that the rounding code may be received before, during or after the receiving of the item codes. After all codes are received, the POS terminal determines a purchase price from the item codes (step 5156). As described above with reference to FIG. 62, the purchase price is determined by summing the price with tax of 20 each item. The POS terminal determines a rounding multiple from the rounding code (step 5158) by accessing the rounding code database 5026 (FIG. 57). Based on the rounding multiple, the POS terminal rounds the purchase price to yield a rounded price (step 5160). The rounded price is the price due in exchange for the items and the upsell.

In the embodiments described above, one upsell was included in a purchase.

However, a plurality of upsells may be included in a purchase. In such an embodiment, one upsell would be sold in exchange for change due, while the remaining upsells would be sold at a fixed price. As described above with reference to FIG. 61, each rounding code has both

- 5 a fixed price and a rounding multiple. Thus, a fixed price may be determined for each upsell.

FIG. 65 illustrates a method 5180 for determining a rounded price for a purchase that includes a plurality of upsells with rounding codes. The POS terminal receives a code for each item in a purchase (step 5182) and also receives a rounding code for each of a plurality 10 of upsells (step 5184). As described above, a purchase price is determined from the item codes (step 5186).

One of the rounding codes is selected (step 5188), and its rounding multiple is determined (step 5190). The selection defines a selected rounding code and a set of unselected rounding codes. The set of unselected rounding codes may consist of one 15 rounding code (if there are two rounding codes) or more than one rounding code. The choice of which rounding code is selected may depend on different criteria. In one embodiment, the POS terminal selects a rounding code having the smallest (minimal) rounding multiple. That is, the POS terminal selects a rounding multiple that is not greater than the rounding multiple of each unselected rounding code. For example, if there are three 20 rounding codes, having corresponding rounding multiples of \$5, \$5 and \$10, then either of the first two rounding codes (having rounding multiples of \$5) would be selected.

Once a rounding code is selected, the fixed price of each remaining (unselected) rounding code is determined (step 5192). As described above, the fixed prices are determinable from the rounding code database 5026 (FIG. 57 and FIG. 61). These fixed

prices are added to the purchase price determined at step 5186, thereby generating an augmented price (step 5194). This augmented price is rounding based on the rounding multiple determined at step 5190, thereby generating a rounded price (step 5196). This rounded price is exchanged for the items and the upsells included in the purchase. Those skilled in the art will understand that the step 5196 may be performed before the step 5194, rather than after.

Referring to FIG. 66, tables 5210 and 5212 each represent data corresponding to a transaction identified by a transaction identifier "12345671". Accordingly, the tables 5210 and 5212 represent data stored in the transaction database 5028 (FIG. 57). The table 5210, similar to the table 5080 of FIG. 62, represents one or more items included in the transaction, and the table 5212, similar to the table 5082 of FIG. 62, represents upsells included in the transaction. The table 5210 includes entries 5214 and 5216, each defining a type of item to purchase. A subtotal price with tax 5218 and tax rate 5220 function as those described above with respect to FIG. 62.

The table 5212 includes entries 5222, 5224 and 5226 that each define an upsell included in the transaction. Similar to the table 5082 (FIG. 62), each entry of the table 5212 includes (i) a rounding code identifier 5228, corresponding to the rounding code identifier 5056 of FIG. 61; (ii) a rounding multiple 5230, corresponding to the rounding multiple 5058 of FIG. 61; and (iii) a fixed value 5232, corresponding to the fixed value 5060 of FIG. 61.

As described above, one upsell is selected to define a rounding multiple, and the remaining upsells have fixed prices that are added to the subtotal price with tax. In accordance with an embodiment described above, in the example described by FIG. 66 an upsell having a minimal rounding multiple is selected. Such an upsell may be either upsell defined by the

entries 5224 and 5226, each having a rounding multiple of \$1. Accordingly, the remaining two upsells have fixed prices of \$1 and \$10.

A table 5234 represents the use of the fixed prices of the upsells. The additional upsell fixed prices 5236, which is the sum of the fixed prices of the remaining (unselected) 5 upsells, is \$11. Thus the subtotal price with the additional upsells 5238 is the sum of \$26.20 and \$11, which is \$37.20. This subtotal price is rounded in accordance with the rounding multiple of the selected upsell (\$1), generating a rounded price 5240 of \$38.00.

In another embodiment of the present invention, each upsell may have a corresponding "minimum price", which is a minimum difference between the subtotal price 10 with tax and the rounded price. For example, if a subtotal price with tax is \$4.98, and a corresponding rounding multiple is \$5.00, then the rounded price would normally be \$5.00 (only \$0.02 extra). However, if a minimum price for the upsell is \$2.00, then a rounded price of \$7.00 (\$4.98 + \$2.00 rounded up to the nearest dollar) is generated.

One or more POS terminals control offers that are provided to customers, such that 15 those offers which have high performance rates are provided. The present invention determines the best offers by providing customers with a group of offers, and evaluating the performance rates of the offers. By contrast, random or manual (human) selection of offers is unlikely to determine the best offers. Furthermore, the present invention advantageously relieves managers or other personnel of the task of selecting offers.

20 By continually evaluating the performance rates of offers, the offers provided to customers continue to be the highest performing. If the performance rate of a once-attractive offer decreases, it can be replaced by other, higher-performing offers.

The present invention may further make the offer appear to the customer to be random, since a POS terminal typically provides different offers at different times. This, in turn, can make it difficult for customers to manipulate the offer system to their advantage.

Referring to FIG. 67, a POS terminal 6010, which may be the IBM "4683" or IBM

- 5 "4693" manufactured by International Business Machines, comprises a processor 6012, such as one or more conventional microprocessors. The processor 6012 is in communication with a data storage device 6014, such as an appropriate combination of magnetic, optical and/or semiconductor memory. The processor 6012 and the storage device 6014 may each be (i) located entirely within a single computer or other computing device; (ii) connected to  
10 each other by a remote communication medium, such as a serial port cable, telephone line or radio frequency transceiver; or (iii) a combination thereof. For example, the POS terminal 6010 may comprise one or more computers which are connected to a remote server computer for maintaining databases.

An input device 6016 preferably comprises a keypad for transmitting input signals,

- 15 such as signals indicative of a purchase, to the processor 6012. A printer 6018 is for registering indicia on paper or other material, thereby printing receipts, coupons and vouchers as commanded by the processor 6012. A display device 6020 is preferably a video monitor for displaying at least alphanumeric characters to the customer and/or cashier. Many types of input devices, printers and display devices are known to those skilled in the  
20 art, and need not be described in detail herein. The input device 6016, printer 6018 and display device 6020 are each in communication with the processor 6012.

The storage device 6014 stores a program 6022 for controlling the processor 6012.

The processor 6012 performs instructions of the program 6022, and thereby operates in accordance with the present invention, and particularly in accordance with the methods

described in detail herein. The program 6022 furthermore includes program elements that may be necessary, such as an operating system and "device drivers" for allowing the processor 6012 to interface with computer peripheral devices, such as the input device 6016, the printer 6018 and the display device 6020. Appropriate device drivers and other  
5 necessary program elements are known to those skilled in the art, and need not be described in detail herein.

The storage device 6014 also stores (i) a database of offers 6024; (ii) a transaction database 6026; and (iii) a performance rate database 6028. The databases 6024, 6026 and 6028 are described in detail below and depicted with exemplary entries in the accompanying  
10 figures. As will be understood by those skilled in the art, the schematic illustrations and accompanying descriptions of the databases presented herein are exemplary arrangements for stored representations of information. A number of other arrangements may be employed besides the tables shown. Similarly, the illustrated entries represent exemplary information, but those skilled in the art will understand that the number and content of the  
15 entries can be different from those illustrated herein.

FIG. 68 illustrates another embodiment of the POS terminal 6010, in which a control device 6028 is in communication via a communication medium 6030 with a system 6032 for providing an offer. The control device 6028 comprises a processor 6034 in communication with the input device 6016 and the display device 6020. The system 6032 for providing an  
20 offer comprises a processor 6036 in communication with the storage device 6014 and the printer 6018. In this embodiment, the control device 6028 may be a cash register, and the system 6032 may be an electronic device for printing coupons in accordance with data received from the cash register. Other configurations of the POS terminal 6010 will be understood by those skilled in the art.

Referring to FIG. 69, a network 6040 includes a server 6042 in communication with POS terminals 6044, 6046 and 6048. The server 6042 directs the operation of, stores data from, and transmits data to the POS terminals 6044, 6046 and 6048. The server 6042 may itself be a POS terminal, as described above, or may be another computing device which can

5 communicate with one or more POS terminals. Although three POS terminals are shown in FIG. 69, any number of POS terminals may be in communication with the server 6042 without departing from the spirit and scope of the present invention. Each of the POS terminals 6044, 6046 and 6048 may be located in the same store, in different stores of a chain of stores, or in other locations. The server 6042 may perform many of the processes

10 described below, especially those processes that are performed for more than one POS terminal. The server 6042 may furthermore store data such as the database of offers 6024.

Referring to FIG. 70, a table 6060 illustrates an embodiment of the database of offers 6024 (FIG. 67). The table 6060 includes entries 6062, 6064, 6066 and 6068, each of which describes an offer to be provided to customers. It will be understood by those skilled in the art that the table 6060 may include any number of entries. Each of the entries 6062, 6064, 6066 and 6068 specifies (i) an offer identifier 6070 for uniquely indicating the offer; (ii) an offer description 6072 for describing the offer; (iii) a cost of the offer 6074 to the offeror; and (iv) an offer frequency 6076. The offer frequency 6076 indicates the average percentage of times that the corresponding offer is to be provided when an offer is provided.

15 For example, each of the entries 6062, 6064, 6066 and 6068 includes an offer frequency of 25%, and thus each of the entries 6062, 6064, 6066 and 6068 will be provided to customers approximately one out of every four times an offer is provided, on average.

20

Referring to FIG. 71, a record 6090 of the transaction database 6026 (FIG. 67) defines the transactions performed at a POS terminal identified by a POS terminal identifier

6092. The transaction database 6026 (FIG. 67) typically includes a plurality of records such as the record 6090, each defining the transactions performed at a different POS terminal. The record 6090 includes entries 6094, 6096 and 6098 which each describe a transaction. It will be understood by those skilled in the art that the record 6090 may include any number 5 of entries. Each of the entries 6094, 6096 and 6098 specifies (i) a transaction identifier 6100 that uniquely indicates a transaction; (ii) a date 6102 of the transaction; (iii) a time 6104 of the transaction; (iv) a purchase description 6106 that describes details of the transaction, such as the items purchased, the purchase price and/or the identity of the customer; (v) an offer identifier 6108 that indicates an offcr that was provided during the transaction; (vi) an 10 indication of whether the offer was accepted 6110; and (vii) a revenue 6112 that is derived due to the customer accepting the offer.

Refcrring to FIG. 72, a flow chart 6120 illustrates a method for controlling offers that are provided at one or more POS terminals. Offers are provided to customers (step 6122) in accordance to the database of offers 6024 (FIG. 67). As described above with 15 reference to the table 6060 (FIG. 70), each offer includes an offer frequency that indicates the average percentage of times that the corresponding offer is to be provided. Thus, the database of offers 6024 indicates which offers are to be provided to customers, and also indicates the frequency with which the offers are to be provided.

For example, the POS terminal 6010 (FIG. 67) (or the server 6042 of FIG. 69, in a 20 networked embodiment) may generate a random number between 0 and 1 each time an offer is to be provided. Then, an offer would be selected in accordance with the random number and with the offer frequency illustrated in FIG. 70. A random number between 0.00 and 0.25 would correspond to the offer "A", while a random number between 0.26 and 0.50 would correspond to the offer "B", and so on for offers "C" and "D".

Alternatively, the POS terminal 6010 or server 6042 can provide a first offer during a first series of transactions, and then provide subsequent offers during consecutive series of transactions. The sizes of the series of transactions (the number of transactions in the series) would be selected in accordance with the offer frequencies 6076 of the table 6060 (FIG. 70).

- 5 For example, each of the offers specified by the table 6060 of FIG. 70 has an equal offer frequency (25%). Thus, the first offer "A" defined by the entry 6062 could be provided to customers during a first series of ten transactions, and the remaining three offers defined by the entries 6064, 6066 and 6068 could be provided during subsequent series of ten transactions each. Since there are four offers and each offer is provided to customers during
- 10 ten out of forty transactions, each offer has a frequency of 25%.

In another embodiment, each of a plurality of POS terminals may provide a different offer to customers. For example, a first POS terminal could provide a first offer during a series of one hundred transactions, and a second POS terminal could provide a second offer during a series of one hundred transactions. Accordingly, both the first offer and the second

15 offer would have a frequency of 50% ( $100 / (100 + 100) = 0.50 = 50\%$ ).

- Once offers are provided to customers at step 6122, the POS terminal 6010 or server 6042 calculates the performance rate of each offer (step 6124). The performance rate may be any measured and/or calculated quantity, such as an Acceptance Rate or a Profit Rate. Many other performance rates will be understood by those skilled in the art. The
- 20 performance rate of each offer may be calculated at predetermined periods, such as at the end of each day, or after predetermined numbers of offers have been provided to customers.

An Acceptance Rate may be calculated in accordance with the following:

$$\text{Acceptance Rate} = \text{Number of Times Accepted} / \text{Number of Times Provided}$$

The Number of Times Provided is the number of times a particular offer was provided to customers. Similarly, the Number of Times Accepted is the number of times that the provided offer was accepted by customers. Both the Number of Times Provided and the

5 Number of Times Accepted may be determined from data stored in the transaction database 6026 (FIG. 67). It is typically desirable to have a high Acceptance Rate, and ideally an offer will have an Acceptance Rate of 100%. However, it is likely that the Acceptance Rate of an offer will be less than 100%.

Referring to FIG. 73, a table 6140 illustrates an embodiment of the performance rate

10 database 6028 (FIG. 67). In this embodiment, the performance rate database 6028 is configured to store Acceptance Rate data as described above. The table 6140 includes entries 6142, 6144, 6146 and 6148, each of which describes an offer that has been provided to customers. It will be understood by those skilled in the art that the table 6140 may include any number of entries. Each of the entries 6142, 6144, 6146 and 6148 specifies (i)

15 an offer identifier 6150 for uniquely indicating the offer; (ii) a number of times accepted 6152; (iii) a number of times provided 6154; and (iv) an acceptance rate 6156 of the offer. The table 6140 may thus be used in determining which offers have the highest performance rate.

A Profit Rate is a performance rate of an offer that may be calculated in accordance

20 with the following:

$$\text{Profit Rate} = (\text{Revenue} - \text{Cost}) / \text{Number of Times Provided}$$

The Revenue is the amount of all income derived due to customers accepting the offer. The Cost is the expense incurred from customers accepting the offer. The Number of Times Provided is the number of times a particular offer was provided to customers.

Referring to FIG. 74, a table 6170 illustrates another embodiment of the performance

- 5 rate database 6028 (FIG. 67). In this embodiment, the performance rate database 6028 is configured to store average profit per offer. The table 6170 includes entries 6172, 6174, 6176 and 6178, each of which describes an offer that has been provided to customers. It will be understood by those skilled in the art that the table 6170 may include any number of entries. Each of the entries 6172, 6174, 6176 and 6178 specifies (i) an offer identifier 6180  
10 for uniquely indicating the offer; (ii) a number of times accepted 6182; (iii) a number of times provided 6184; (iv) an average revenue derived per accepted offer 6186; (v) an average profit derived per accepted offer 6188; and (vi) an average profit derived per offer 6190.

Those skilled in the art will understand that the number of times accepted 182, the  
15 number of times provided 6184 and the average revenue 6186 may be determined from data stored in the transaction database 6026 (FIG. 67). For example, referring again to the record 6090 of FIG. 71, at the POS terminal #7 the offers "A", "B" and "C" have each been offered once, as seen from the offer identifier 6108. The offers "B" and "C" have each been accepted once, as indicated by the offer accepted 6110 field. Similarly, the revenue derived  
20 for the offers "A", "B" and "C" is \$0.00, \$0.50 and \$0.78 respectively. An average revenue for each offer would be derived by dividing the total revenue from each offer by the number of times it was offered.

The average profit per accepted offer 6188 may be determined by subtracting the cost per offer (the cost 6074 of FIG. 70) from the average revenue 6186. Finally, the

average profit per offer 6190, which is the profit rate defined above, may be determined by multiplying the average profit per accepted offer 6188 by the acceptance rate of the offer.

As described above, the acceptance rate of the offer is determined by dividing the number of times accepted 6182 by the number of times provided 6184.

- 5 Referring again to FIG. 72, after the performance rates of the offers have been calculated (step 6124), the POS terminal 6010 or server 6042 determines modifications to the database of offers 6024 based on the performance rates (step 6126). Each offer may be provided at a different offer frequency, or even discontinued, in accordance with the calculated performance rate of that offer. As described below, offers with higher  
10 performance rates continue to be provided to customers, and are typically provided at higher offer frequencies. Similarly, offers with low performance rates are typically provided at lower offer frequencies, or may even cease to be provided altogether.

- In one embodiment, only offers having performance rates greater than a predetermined threshold continue to be provided to customers. If one or more offers cease  
15 to be provided, each offer frequency must be changed, as described below.

- FIG. 75 illustrates the selection of offers to discontinue. A table 6200 depicts data stored in an embodiment of the performance rate database 6028 (FIG. 67). For each offer, there is an offer identifier 6202 and an acceptance rate 6204. A threshold 6206 of 10% defines which of the offers in the table 6200 will continue to be provided. In particular, the  
20 offers defined by entries 6208 and 6210 (the offers "A" and "B") have acceptance rates greater than 10%, and thus will continue to be provided. By contrast, the offers defined by entries 6212 and 6214 (the offers "C" and "D") have acceptance rates less than 10%, and thus will be discontinued.

A table 6216 depicts data stored in an embodiment of the database of offers 6024 (FIG. 67). As described above with respect to FIG. 70, each offer has an offer identifier 6218 and an offer frequency 6220. Since the offers "C" and "D" have been discontinued, the corresponding offer frequencies of those offers are 0%. The offer frequencies of the 5 offers "A" and "B", which continue to be offered, change accordingly. The offer frequencies may be changed so that they are equal to each other (50% each). Alternatively, the offer frequencies may be changed in accordance with their relation to one another, as follows:

10  $F_{\text{new}} = F_{\text{old}} / F_{\text{total}}$

Where:

$F_{\text{new}}$  is the new offer frequency

$F_{\text{old}}$  is the offer frequency prior to being changed

15  $F_{\text{total}}$  is the sum of the values of  $F_{\text{old}}$  for the offers that are not discontinued

In FIG. 75, the offer frequency "58%" of the offer "A" is calculated by from the offer frequencies of the offers that are not discontinued:

20  $58\% = 20.4\% / (20.4\% + 14.8\%)$

The offer frequency "42%" of the offer "B" is similarly calculated:

$$42\% = 14.8\% / (20.4\% + 14.8\%)$$

Those skilled in the art will understand that there are other methods for changing the offer frequencies of offers.

In another embodiment, a predetermined number of the highest-performing offers

- 5 continue to be provided to customers. The remaining offers, if any, are not provided. FIG. 76 illustrates the selection of offers to discontinue in this embodiment. A table 6240 depicts data stored in another embodiment of the performance rate database 6028 (FIG. 67). For each offer, there is an offer identifier 6242 and an average profit per order 6244. A threshold 6246 of "three" defines the number of highest-performing offers in the table 6240  
10 which will continue to be provided. In particular, the offers defined by entries 6248, 6250 and 6252 (the offers "A", "B" and "C") are the top three offers with respect to average profit per order, and thus will continue to be provided. By contrast, the offer defined by entry 6254 (the offer "D") will be discontinued.

A table 6256 depicts data stored in an embodiment of the database of offers 6024

- 15 (FIG. 67). As described above, each offer has an offer identifier 6258 and an offer frequency 6260. Since the offer "D" has been discontinued, the corresponding offer frequency is 0%. The offer frequencies of the offers "A", "B" and "C", which continue to be offered, change accordingly. The offer frequencies may be changed so that they are equal to each other (33 1/3% each). Alternatively, the offer frequencies may be changed in  
20 accordance with their relation to one another, in the manner described above.

Once offers have been discontinued, it may be desirable to make them available again at some time in the future. For example, after an offer has been discontinued due to a poor performance rate, conditions such as consumer tastes may change. Accordingly, discontinued offers may continue to be maintained in the database of offers 6024 (FIG. 67),

and, after an offer has been discontinued for more than a predetermined amount of time, it may be advantageous to evaluate its performance rate once again. The discontinued offer may be granted a randomly-selected or predetermined offer frequency, allowing the corresponding performance rate to be evaluated.

- 5        In addition, in some situations, after offers are discontinued only one offer may continue to be offered. The performance rate of this offer is evaluated, and compared with the performance rate of the offer in prior time periods. If the performance rate declines below that of prior time periods, the offer may be discontinued and replaced. As a replacement, another (discontinued) offer may be granted a randomly-selected or
- 10      predetermined offer frequency, allowing the corresponding performance rate to be evaluated.

In some embodiments it may be desirable that the offer frequency of certain offers be unchanged, regardless of the performance rate calculated for those offers. For example, a high-value offer could have a very low offer frequency. The offer could then act as a prize 15 that few customers could receive. Accordingly, the cost of giving such a high-value offer in exchange for change due would be incurred rarely, yet could serve as advertising to prompt customers to frequent a business.

Referring to FIG. 77, a table 6300, similar to the table 6060 of FIG. 70, illustrates another embodiment of the database of offers 6024 (FIG. 67). The table 6300 includes 20 entries 6302, 6304, 6306 and 6308, each of which describes an offer to be provided to customers. Each of the entries 6302, 6304, 6306 and 6308 specifies (i) an offer identifier 6310 for uniquely indicating the offer; (ii) an offer description 6312 for describing the offer; (iii) a cost of the offer 6314 to the offeror; (iv) an offer frequency 6316 and (v) a fixed frequency indication 6318. The fixed frequency indication 6318 indicates whether the

corresponding offer frequency may be changed based on the performance rate of the offer, as described above. For example, the entry 6308 includes an offer frequency of 1%. Since this offer has a relatively high value (\$50 gift certificate), it is likely that it will be accepted often, perhaps always. However, the high cost (\$50) of the offer can make it unprofitable to  
5 offer more frequently. Accordingly, the frequency of that offer is fixed at 1%.

Although the present invention has been described with respect to a preferred embodiment thereof, those skilled in the art will note that various substitutions may be made to those embodiments described herein without departing from the spirit and scope of the present invention.

## WHAT IS CLAIMED IS:

1. A system comprising:

a lottery data processing system;

5 a controller including a storage device storing merchandise information, said controller adapted to receive lottery information from said lottery data processing system; at least one POS terminal connected to said controller, for performing merchandise transactions and lottery transactions in accordance with the received lottery information; and

10 said POS terminal including a recorder for recording on a recording medium the merchandise and lottery information.

2. The system according to Claim 1, wherein said controller communicates in substantially real-time with said lottery data processing system.

15

3. The system according to Claim 1, wherein the storage device stores lottery information received from said lottery data processing system that includes randomly selected lottery ticket numbers.

20 4. The system according to Claim 2, wherein said POS terminal is adapted for input of customer-selected lottery numbers, said controller is adapted to transmit the customer-selected lottery numbers to said lottery data processing system, and said controller is adapted to receive from said lottery data processing system an encrypted authentication code and authorization to perform the lottery transaction.

5. The system according to Claim 1, wherein said controller is a store network server.

6. A method for performing a lottery transaction, comprising the steps of:

5 initiating the lottery transaction at a POS terminal adapted to perform both  
lottery transactions and merchandise transactions;

communicating from the POS terminal to a POS controller, operatively connected to  
said POS terminal, that the lottery transaction has been initiated;

establishing communication between the POS controller and a lottery data

10 processing system adapted to communicate with the POS controller;

requesting lottery information be transmitted from the lottery data processing system  
to the POS controller;

generating the lottery information in the lottery data processing system;

transmitting the lottery information from the lottery data processing system to the

15 POS terminal via the POS controller; and

outputting the lottery information on a recording medium by the POS terminal.

7. The method according to Claim 6, wherein said generating step comprises generating  
lottery information that includes randomly selected lottery numbers and an encrypted

20 authentication code.

8. The method according to Claim 6, wherein said outputting step comprises outputting  
a recording medium comprising a sales receipt having information relating to the lottery  
transaction and a merchandise transaction.

9. A method according to Claim 6, further comprising the steps of:
  - inputting customer-selected lottery numbers to the POS terminal;
  - sending the customer-selected lottery numbers to the lottery data processing system;5 and
  - wherein said generating step comprises generating lottery information that includes an authorization to complete the lottery transaction using the customer-selected lottery numbers and an encrypted authentication code related to the customer-selected lottery numbers.
10. A method according to Claim 6 further comprising the steps of:
  - inputting into the POS terminal an indication of a percentage of a full price lottery ticket;
  - sending the indication to the lottery data processing system; and15 wherein said generating step comprises generating lottery information that includes an authorization for a fractional lottery ticket transaction.
11. A lottery data processing system comprising:
  - a lottery controller including a CPU and a memory operatively connected to said 20 CPU;
  - said lottery controller adapted to communicate with at least one remote controller that includes a storage device for storing merchandise information, said lottery controller adapted to receive a request for lottery information from said remote controller and to transmit, in response, the lottery information to said remote controller; and

said memory in said lottery controller containing a program, adapted to be executed by said CPU, for processing the request for the lottery information, generating the requested lottery information, and maintaining a database within said memory to store the requested lottery information.

5

12. The system according to Claim 11, wherein said program in said memory is adapted to generate lottery information that includes at least one group of randomly selected lottery numbers and an encrypted authentication code for transmittal to said remote controller.

10 13. The system according to Claim 11, wherein said lottery controller is adapted to receive from said remote controller at least one group of customer-selected lottery numbers.

14. The system according to Claim 13, wherein said program in said memory is adapted to generate lottery information that includes an authorization to complete a lottery

15 transaction related to the request for the lottery information and an encrypted authentication code related to the group of customer-selected lottery numbers for transmittal to said remote controller.

15. The system according to Claim 12, further comprising:

20 an IVRU operatively connected to said lottery controller and to a PSTN;  
wherein said lottery controller is adapted to receive an alphanumeric code from said PSTN via said IVRU; and  
said program in said memory is further adapted to

search said database within said memory to find a stored encrypted authentication code that matches the alphanumeric code, and if a match is found, decrypt the alphanumeric code, and send a first message to said PSTN via said IVRU, otherwise send a second message to said PSTN via said IVRU.

5

16. The system according to Claim 14, further comprising:

an IVRU operatively connected to said lottery network controller and to a PSTN;  
wherein said lottery controller is adapted to receive an alphanumeric code from said PSTN via said IVRU; and

10 said program in said memory is further adapted to

search said database within said memory to find a stored encrypted authentication code that matches the alphanumeric code, and if a match is found, decrypt the alphanumeric code, and send a first message to said PSTN via said IVRU, otherwise send a second message to said PSTN via said IVRU.

15

17. The system according to Claim 15, wherein the first message includes information based on the decrypted alphanumeric code.

18. The system according to Claim 15, wherein the second message includes an  
20 indication that no match was found.

19. The system according to Claim 15, wherein the first message comprises an indication as to whether the alphanumeric code is from a winning lottery ticket.

20. A method for processing a request for lottery information using a lottery controller including a CPU and a memory operatively connected to said CPU, wherein the memory contains a program, adapted to be executed by said CPU, for processing lottery information requests, said method comprising the steps of:

5 receiving a request for lottery information from a data processing system adapted to perform lottery ticket transactions and merchandise transactions;

generating lottery information based on the request for lottery information;

storing the lottery information in the memory; and

transmitting the lottery information to the data processing system adapted to perform

10 lottery ticket transactions and merchandise transactions.

21. A method for processing a lottery ticket request, comprising the steps of:

receiving a request for at least one lottery ticket;

generating randomly selected numbers to be used for the lottery ticket;

15 generating an authentication code comprising the randomly selected numbers;

encrypting the authentication code;

storing the randomly selected numbers and the encrypted authentication code in a storage device; and

outputting the randomly selected numbers and the encrypted authentication code.

20

22. A method according to Claim 21, wherein the request in said receiving step is for a fractional lottery ticket.

23. Computer executable process steps, stored on a computer readable medium, for processing lottery ticket transactions, comprising:

a step to receive a lottery ticket request;

a step to generate randomly selected lottery numbers;

5 a step to generate an authentication code based upon the randomly selected lottery numbers;

a step to encrypt the authentication code;

a step to store the randomly selected lottery numbers and the encrypted authentication code in a storage device; and

10 a step to output the randomly selected lottery numbers and the encrypted authentication code.

24. Computer executable process steps according to Claim 23, wherein the lottery ticket request in said step to receive is for a fractional lottery ticket.

15

25. A system for performing lottery ticket transactions and merchandise transactions, comprising:

a POS controller including a storage device storing merchandise information and lottery information;

20 said POS controller adapted to communicate with a lottery data processing system; said POS controller further adapted to transmit a request for lottery information to said lottery data processing system and to receive, in response, the requested lottery information from said lottery data processing system;

at least one POS terminal, operatively connected to said POS controller, for performing merchandise transactions and lottery transactions in accordance with the received lottery information; and

a recorder connected to said POS terminal for issuing a receipt for the merchandise

- 5 and lottery transactions, said receipt comprising the lottery information from said lottery data processing system.

26. A method for performing lottery ticket transactions and merchandise transactions utilizing a POS terminal operatively connected to a POS controller including a storage

- 10 device storing merchandise information, comprising the steps of:

initiating at the POS terminal a transaction for a plurality of items to be purchased, including a request to purchase at least one lottery ticket;

inputting to the POS terminal a request for lottery ticket information;

transmitting to the POS controller the request for lottery ticket information;

- 15 receiving at the POS terminal from the POS controller the requested lottery ticket information; and

recording on a recording medium the lottery ticket information and the merchandise transaction.

- 20 27. A method according to Claim 26, further comprising the step of storing the requested lottery ticket information in the storage device of the POS controller.

28. A data processing system, comprising:

- a POS controller including a CPU and a storage device operatively connected to said CPU;
- said POS controller adapted to receive from at least one POS terminal, capable of performing lottery transactions and merchandise transactions, a request for lottery information;
- 5 information;
- said POS controller further adapted to communicate the request for lottery information to a lottery data processing system that is capable of generating lottery information, and to receive, in response, the requested lottery information; and
- said storage device in said POS controller containing a program, adapted to be
- 10 executed by said CPU, for processing the request for the lottery information from said POS terminal.

29. A method for processing lottery ticket requests using a POS controller including a CPU and a storage device operatively connected to said CPU and containing a program, adapted to be executed by said CPU, for processing lottery ticket requests, comprising the steps of:

receiving a request for lottery information from a POS terminal performing lottery transactions and merchandise transactions;

transmitting the request to a lottery data processing system capable of generating lottery information based on the request for lottery information;

receiving the lottery information from the lottery data processing system; and

sending the lottery information to the POS terminal.

30. A transaction processing device, comprising:

a POS terminal adapted to perform lottery transactions and merchandise transactions;  
said POS terminal adapted to communicate with a POS controller;  
said POS terminal adapted to transmit a request for lottery information to said POS  
controller and to receive the requested lottery ticket information from said POS controller;  
5 and  
said POS terminal including a recorder for recording on a recording medium the  
merchandise and lottery transactions.

31. A method for performing lottery ticket transactions and merchandise transactions  
10 utilizing a POS terminal operatively connected to a POS controller that is adapted to  
communicate with a lottery data processing system, comprising the steps of:  
initiating at the POS terminal a transaction for a plurality of items to be purchased,  
including a request to purchase at least one lottery ticket;  
inputting to the POS terminal a request for lottery information;  
15 receiving at the POS terminal lottery information including an encrypted  
authentication code; and  
recording on a recording medium the lottery information and the merchandise  
transaction.
32. The method according to Claim 31, wherein said inputting step comprises inputting a  
20 request for lottery information that includes randomly selected lottery numbers, and said  
receiving step comprises receiving the randomly selected lottery numbers and the encrypted  
authentication code.

33. The method according to Claim 31, wherein said inputting step comprises requesting that specific customer-selected lottery numbers be used as at least a part of the lottery information being requested.
- 5 34. The method according to Claim 31, wherein the request in said initiating step is for a fractional lottery ticket.
35. The method according to Claim 34, wherein the received lottery information includes an authorization to perform a fractional lottery ticket transaction.
- 10 36. A method of purchasing a lottery ticket, comprising:  
requesting the purchase of at least one lottery ticket and at least one item of merchandise;  
receiving a recording medium constituting the lottery ticket and containing  
15 information concerning the purchase of the item of merchandise.

37. A method according to Claim 36, wherein the lottery ticket requested in said requesting step is a fractional lottery ticket.

- 20 38. A method of purchasing a lottery ticket comprising:  
requesting the purchase of an item of merchandise; tendering an amount of money for the purchase, in excess of the purchase price;  
directing that the amount of money for the purchase in excess of the purchase price be applied to the purchase of a fractional value lottery ticket; and

receiving a recording medium constituting the fractional value lottery ticket and containing information concerning the purchase of the item of merchandise.

39. A method for authenticating a lottery ticket using a lottery central controller

5 including a storage device, comprising the steps of:

receiving first information related to the lottery ticket;  
determining whether the first information is equivalent to second information stored in the storage device, where the second information relates to a plurality of authorized lottery tickets;

10 if no equivalent is found, outputting a first message indicating that no match was found;

if an equivalent is found, performing a decryption operation on the first information; and

outputting a second message based on the decryption operation.

15

40. The method according to Claim 39, wherein the received first information comprises an encrypted authentication code.

41. The method according to Claim 39, wherein said receiving step comprises receiving

20 the first information via an IVRU operatively connected to a PSTN.

42. The method according to Claim 39, wherein said receiving step comprises receiving the first information from another data processing system.

43. The method according to Claim 39, wherein the second message comprises a report as to whether the lottery ticket is a winning lottery ticket.

44. The method according to Claim 40, wherein the decryption operation comprises

- 5 decrypting the encrypted authentication code, and the second message comprises information based on the decrypted authentication code.

45. A receipt, comprising a recording medium, recorded thereon lottery ticket

information, merchandise transaction information and an encrypted authentication code.

10

46. The receipt according to Claim 45, wherein the lottery ticket information comprises a fractional lottery ticket.

47. A transaction processing system, comprising:

15 a POS terminal adapted to perform lottery ticket transactions and merchandise transactions;

an input device associated with said POS terminal for inputting information to said POS terminal related to at least one item to be purchased and an amount of money tendered to pay for the item;

20 said POS terminal adapted to calculate an amount of change based on the amount of money tendered to pay for the item;

said input device including an actuatable member for causing said POS terminal to perform a lottery ticket transaction by applying the amount of change toward purchase of an amount of lottery tickets equal in value to the calculated amount of change; and

said POS terminal including a recorder for recording on a recording medium the merchandise transaction and the amount of lottery tickets purchased with the calculated amount of change.

5 48. The system according to Claim 47, where the amount of lottery tickets purchased includes a fractional lottery ticket.

49. A method for determining an upsell of a purchase at a point-of-sale terminal, comprising:

10 generating a purchase price of the purchase;

generating a rounded price;

calculating a round-up amount, the round-up amount being a difference between the purchase price and the rounded price;

generating a selection signal for indicating selection between the upsell and change;

15 and

exchanging the round-up amount for the upsell if the selection signal indicates selection of the upsell.

50. The method of claim 49, further comprising:

20 if the selection signal indicates selection of change,

identifying a second upsell,

generating a second selection signal for indicating selection between the second upsell and change, and

exchanging the round-up amount for the second upsell if the second selection signal indicates selection of the second upsell.

51. The method of claim 50, further comprising:  
generating a random value; and wherein the step of identifying a second upsell is  
performed only if the random value is within a prescribed range of values.

5 52. The method of claim 49, further comprising:  
printing a voucher.

53. The method of claim 52, further comprising:  
maintaining an identifier database;  
10 generating a unique identifier;  
storing the unique identifier in the identifier database; and  
printing the unique identifier on the voucher.

54. The method of claim 52, further comprising:  
15 generating a date identifier in dependence on a date of the purchase; and  
printing the date identifier on the voucher.

55. The method of claim 49, further comprising:  
maintaining a database of offered upsells;  
20 storing the round-up amount in the database of offered upsells;  
storing the upsell in the database of offered upsells; and  
storing the selection signal in the database of offered upsells.

56. The method of claim 55, further comprising:

storing a date of the purchase in the database of offered upsells.

57. The method of claim 49, wherein the upsell comprises a game entry.

5 58. The method of claim 57, further comprising:

maintaining a game database;

generating a unique identifier;

storing the unique identifier in the game database; and

storing the round-up amount in the game database.

10

59. The method of claim 49, further comprising:

if the selection signal indicates selection of the upsell, storing signals indicative of the upsell in a customer record, thereby associating the upsell with a customer.

15 60. The method of claim 59, further comprising:

storing signals indicative of a first customer identifier for identifying a first customer who donates the upsell; and

storing signals indicative of a second customer identifier for identifying a second customer who receives the upsell.

20

61. The method of claim 59, further comprising:

storing signals indicative of a first customer identifier for identifying a first customer who donates the upsell;

storing signals indicative of a plurality of customer identifiers for identifying a plurality of customers; and

selecting at least one of the plurality of customer identifiers, thereby selecting at least one customer to receive the upsell.

5

62. The method of claim 49, wherein the step of identifying the upsell comprises identifying a plurality of upsells in the database which correspond to the compared upsell price, and wherein the step of outputting comprises outputting signals indicative of at least one of the plurality of identified upsells.

10

63. The method of claim 62, further comprising:  
generating a selection signal for indicating selection between at least one of the plurality of identified upsells and change.

15 64. The method of claim 62, further comprising:

sorting the plurality of identified upsells, thereby arranging a first upsell to be ordered before a second upsell.

20 65. The method of claim 64, wherein the step of outputting comprises outputting signals indicative of the first upsell.

66. The method of claim 65, further comprising:

generating a selection signal for indicating selection between the identified upsell and change; and

outputting signals indicative of the second upsell if the selection signal does not indicate selection of the first upsell.

67. The method of claim 64, wherein the step of sorting comprises sorting the plurality  
5 of identified upsells according to a cost of each identified upsell.

68. The method of claim 49, further comprising:  
generating a purchase condition,  
and wherein the step of maintaining a database comprises:  
10 maintaining a database of at least one upsell price and a corresponding upsell and at least  
one corresponding upsell condition,  
and wherein the step of identifying comprises:  
identifying at least one upsell in the database which corresponds to the compared upsell  
price and the purchase condition.

15

69. The method of claim 49, wherein the step of generating a rounded price comprises  
generating a rounded price in dependence on a whole number which is greater than the  
purchase price.

20 70. The method of claim 69, wherein the step of generating a rounded price comprises  
generating a rounded price in dependence on the smallest whole number which is greater  
than the purchase price.

71. The method of claim 49, wherein the step of generating a rounded price comprises generating a rounded price in dependence on a multiple of  $\frac{1}{4}$  which is greater than the purchase price.

5 72. The method of claim 49, further comprising:

storing a preferred-upsell signal indicative of an upsell for each of a plurality of customers.

73. The method of claim 72, wherein the step of generating the selection signal

10 comprises accessing the stored preferred-upsell signals, and generating the selection signal in dependence thereupon.

74. A method for determining an upsell of a purchase at a point-of-sale terminal, comprising:

15 maintaining a database of at least one upsell price and a corresponding upsell; generating a purchase price of the purchase; generating a rounded price; calculating a round-up amount, the round-up amount being a difference between the purchase price and the rounded price;

20 comparing the calculated round-up amount with at least one of the upsell prices in the database; and

if the calculated round-up amount corresponds to a compared upsell price, identifying at least one upsell in the database which corresponds to the compared upsell price.

75. The method of claim 74, further comprising:

generating a selection signal for indicating selection between the identified upsell  
and change.

5

76. The method of claim 75, wherein the database includes a plurality of upsell prices  
and corresponding upsells, the method further comprising:

if the selection signal indicates selection of change, identifying a second upsell in the  
database which corresponds to the compared upsell.

10

77. The method of claim 74, wherein the step of generating a selection signal comprises:

generating a selection signal for indicating selection between the identified upsell,  
change and a second upsell,

and the method further comprising:

15 if the selection signal indicates selection of the second upsell, determining a second upsell  
price corresponding to the second upsell.

78. The method of claim 75, further comprising:

printing a voucher.

20

79. The method of claim 78, further comprising:

printing an identifier on the voucher.

80. The method of claim 78, further comprising:

maintaining an identifier database;  
generating a unique identifier;  
storing the unique identifier in the identifier database; and  
printing the unique identifier on the voucher.

5

81. The method of claim 78, further comprising:  
generating a date identifier in dependence on a date of the purchase; and  
printing the date identifier on the voucher.

10 82. The method of claim 75, further comprising:

maintaining a database of offered upsells;  
storing the round-up amount in the database of offered upsells;  
storing the identified upsell in the database of offered upsells; and  
storing the selection signal in the database of offered upsells.

15

83. The method of claim 82, further comprising:  
storing a date of the purchase in the database of offered upsells.

84. The method of claim 75, wherein the upsell comprises a game entry.

20

85. The method of claim 84, further comprising:  
maintaining a game database;  
generating a unique identifier;  
storing the unique identifier in the game database; and

storing the round-up amount in the game database.

86. The method of claim 75, further comprising:

if the selection signal indicates selection of the identified upsell, storing signals

- 5 indicative of the identified upsell in a customer record, thereby associating the identified  
upsell with a customer.

87. The method of claim 86, further comprising:

storing signals indicative of a first customer identifier for identifying a first customer

- 10 who donates the identified upsell; and

storing signals indicative of a second customer identifier for identifying a second customer  
who receives the donated upsell.

88. The method of claim 86, further comprising:

- 15 storing signals indicative of a first customer identifier for identifying a first customer  
who donates the identified upsell;

storing signals indicative of a plurality of customer identifiers for identifying a plurality of  
customers; and

- selecting at least one of the plurality of customer identifiers, thereby selecting at least one  
20 customer who receives the donated upsell.

89. The method of claim 75, further comprising:

storing a preferred-upsell signal indicative of an upsell for each of a plurality of  
customers.

90. The method of claim 89, wherein the step of generating the selection signal comprises accessing the stored preferred-upsell signals, and generating the selection signal in dependence thereupon.

5

91. The method of claim 74, wherein the step of identifying the upsell comprises identifying a plurality of upsells in the database which correspond to the compared upsell price.

10 92. The method of claim 91, further comprising:

generating a selection signal for indicating selection between at least one of the plurality of identified upsells and change.

93. The method of claim 91, further comprising:

15 sorting the plurality of identified upsells, thereby arranging a first upsell to be ordered before a second upsell.

94. The method of claim 93, wherein the step of sorting comprises sorting the plurality of identified upsells according to a cost of each identified upsell.

20

95. The method of claim 74, further comprising:

generating a purchase condition,

and wherein the step of maintaining a database comprises:

maintaining a database of at least one upsell price and a corresponding upsell and at least one corresponding upsell condition,

and wherein the step of identifying comprises:

identifying at least one upsell in the database which corresponds to the compared upsell

- 5 price and the purchase condition.

96. The method of claim 74, wherein the step of generating a rounded price comprises generating a rounded price in dependence on a whole number which is greater than the purchase price.

10

97. The method of claim 96, wherein the step of generating a rounded price comprises generating a rounded price in dependence on the smallest whole number which is greater than the purchase price.

15 98. The method of claim 74, wherein the step of generating a rounded price comprises generating a rounded price in dependence on a multiple of  $\frac{1}{4}$  which is greater than the purchase price.

99. An apparatus for determining an upsell of a purchase, comprising:

- 20 a storage device; and

a processor connected to the storage device,

the storage device storing

a database of at least one upsell price and a corresponding upsell, and

a program for controlling the processor; and

the processor operative with the program to  
generate a purchase price of the purchase,  
generate a rounded price,  
calculate a round-up amount, the round-up amount being a difference between the purchase

5 price and the rounded price,

compare the calculated round-up amount with at least one of the upsell prices in the  
database, and

if the calculated round-up amount corresponds to a compared upsell price, identify at least  
one upsell in the

10 database which corresponds to the compared upsell price.

100. The apparatus of claim 99, wherein the processor is further operative with the  
program to generate a selection signal for indicating selection between the identified upsell  
and change.

15

101. The apparatus of claim 100, wherein the database includes a plurality of upsell prices  
and corresponding upsells, and wherein the processor is further operative with the program  
to identify a second upsell in the database which corresponds to the compared upsell if the  
selection signal indicates selection of change.

20

102. The apparatus of claim 99, wherein the processor is further operative with the  
program to:

generate a selection signal for indicating selection between the identified upsell,  
change and a second upsell, and

if the selection signal indicates selection of the second upsell, determine a second upsell price corresponding to the second upsell.

103. The apparatus of claim 100, further comprising:

5 a printer connected to the processor for printing a voucher.

104. The apparatus of claim 103, wherein the processor is further operative with the program to drive the printer to print an identifier on the voucher.

10 105. The apparatus of claim 103, wherein the storage device further stores an identifier database; and

wherein the processor is further operative with the program to:

generate a unique identifier;

store the unique identifier in the identifier database; and

15 drive the printer to print the unique identifier on the voucher.

106. The apparatus of claim 103, wherein the processor is further operative with the program to:

generate a date identifier in dependence on a date of the purchase; and

20 drive the printer to print the date identifier on the voucher.

107. The apparatus of claim 100, wherein the storage device further stores a database of offered upsells;

and wherein the processor is further operative with the program to:

- store the round-up amount in the database of offered upsells;
- store the identified upsell in the database of offered upsells; and
- store the selection signal in the database of offered upsells.

5 108. The apparatus of claim 107, wherein the processor is further operative with the program to store a date of the purchase in the database of offered upsells.

109. The apparatus of claim 100, wherein the upsell comprises a game entry.

10 110. The apparatus of claim 109, wherein the storage device further stores a game database, and  
wherein the processor is further operative with the program to:  
generate a unique identifier;  
store the unique identifier in the game database; and  
15 store the round-up amount in the game database.

111. The apparatus of claim 100, wherein the storage device further stores a customer record, and wherein the processor is further operative with the program to:

if the selection signal indicates selection of the identified upsell, store signals  
20 indicative of the identified upsell in the customer record, thereby associating the identified upsell with a customer.

112. The apparatus of claim 111, wherein the storage device further stores:

signals indicative of a first customer identifier for identifying a first customer who donates the identified upsell; and

signals indicative of a second customer identifier for identifying a second customer who receives the donated upsell.

5

113. The apparatus of claim 111, wherein the storage device further stores:

signals indicative of a first customer identifier for identifying a first customer who donates the identified upsell; and

signals indicative of a plurality of customer identifiers for identifying a plurality of

10 customers;

and wherein the processor is further operative with the program to select at least one of the plurality of customer identifiers, thereby selecting at least one customer who receives the donated upsell.

15 114. The apparatus of claim 100, wherein the storage device further stores a preferred-upsell signal indicative of an upsell for each of a plurality of customers.

115. The apparatus of claim 114, wherein the processor is further operative with the program to access the stored preferred-upsell signals, and generate the selection signal in dependence thereupon.

20 116. The apparatus of claim 100, wherein the processor is further operative with the program to identify a plurality of upsells in the database which correspond to the compared upsell price.

117. The apparatus of claim 116, wherein the processor is further operative with the program to:

generate a selection signal for indicating selection between at least one of the

5 plurality of identified upsells and change.

118. The apparatus of claim 116, wherein the processor is further operative with the program to:

sort the plurality of identified upsells, thereby arranging a first upsell to be ordered before a

10 second upsell.

119. The apparatus of claim 118, wherein the processor is further operative with the program to sort the plurality of identified upsells according to a cost of each identified upsell.

15

120. The apparatus of claim 99, wherein the storage device further stores:

a database of at least one upsell price and a corresponding upsell and at least one corresponding upsell condition;

and wherein the processor is further operative with the program to

20 generate a purchase condition, and

identify at least one upsell in the database which corresponds to the compared upsell price and the purchase condition.

121. The apparatus of claim 99, wherein the processor is further operative with the program to generate a rounded price in dependence on a whole number which is greater than the purchase price.

5 122. The apparatus of claim 121, wherein the processor is further operative with the program to generate a rounded price in dependence on the smallest whole number which is greater than the purchase price.

10 123. The apparatus of claim 99, wherein the processor is further operative with the program to generate a rounded price in dependence on a multiple of  $\frac{1}{4}$  which is greater than the purchase price.

124. A method for determining an upsell of a purchase at a point-of-sale terminal, the terminal storing a required payment amount, comprising:  
15 maintaining a database of at least one upsell price and a corresponding upsell; generating a purchase price of the purchase; setting the required payment amount to be equal to the purchase price; generating a rounded price; calculating a round-up amount, the round-up amount being a difference between the  
20 purchase price and the rounded price; comparing the calculated round-up amount with at least one of the upsell prices in the database; and if the calculated round-up amount corresponds to a compared upsell price,

identifying at least one upsell in the database which corresponds to the compared upsell price, and  
outputting signals indicative of the identified upsell.

5 125. The method of claim 124, further comprising:

generating a selection signal for indicating selection between the identified upsell and change; and  
setting the required payment amount to be equal to the rounded price if the selection signal indicates selection of the identified upsell.

10

126. The method of claim 125, wherein the database includes a plurality of upsell prices and corresponding upsells, the method further comprising:

if the selection signal indicates selection of change,  
identifying a second upsell in the database which corresponds to the compared upsell price, and  
outputting signals indicative of the identified second upsell.

127. The method of claim 126, further comprising:

generating a random value; and wherein the step of outputting signals indicative of the identified second upsell is performed only if the random value is within a prescribed range of values.

128. The method of claim 124, wherein the step of generating a selection signal comprises: